Supplementary Materials

Detrital Zircon Provenance Sources for the Badong and Yingzuishan Formations.

Grains Older Than 2600 Ma. – Sample 16-1-15-3 contained only 2 grains in this age range, and sample 17-1-15-1A did not yield any (Fig. 7). The only potential nearby source known for these zircons is the Taihua Supergroup within the QD belt. The orogen is currently located north of the NCC-SCC suture zone, suggesting a northern provenance (Figs. 11; e.g., Ni et al., 2014).

Grains 2300–2600 Ma. –There were only 2 grains in each sample in this range (Fig. 7). Zhu et al. (2011) argued that some terranes in the Kuanping Group of the QD belt could be dated to 2300–2600 Ma. Numerous additional sources have been suggested for zircons of this age, such as basement rock beneath the SCC (2300 - 2500 Ma; Zeng and Yan, 2014). The NCC has many exposures that have been dated to approximately 2500 Ma, and which could also have supplied some of these zircon grains (e.g. Zhao and Cawood, 2012). Due to the small subsample size, it is impossible to constrain their likely source.

Grains 2050–2300 Ma. – Lotosaurus Quarry zircon grains in this range are probably attributable to regional events in the NCC. Sample 16-1-15-3 yielded two grains in this age bracket, and sample 17-1-15-1A only yielded one (Fig. 7). Potential sources for these grains include lamproites in Jinshan (1900–2100 Ma; Zheng et al., 2006) and the Shuidigou Group of the Huaxing Block (2100–2300 Ma; e.g. Chen and Fu, 1992). The Songyang Orogeny also occurred in the NCC around 2150 Ma, potentially supplying some zircon grains (Chen and Zhao, 1997). With only three zircons in this age range it is difficult to adequately assess provenance, but a northern source is most plausible.

Grains 1550–2050 Ma. – Zircon grains in this range are generally attributed to the assembly and breakup of the Columbia supercontinent (e.g. Liu et al., 2014). Sample 16-1-15-3 yielded 10 grains and sample 17-1-15-1A yielded three grains in this age range (Fig. 7). Grains in this age bracket are common in southern China, and have many possible sources on both the NCC and the SCC; here we only list a few of the possible terranes, and focus our discussion on more general trends. Possible sources include the Xiong'er Group along the southern margin of the NCC (e.g. He et al., 2009), as well as the Huangling complex and Zhejiang Province, which are both known to have terranes with ages of 1800–1900 Ma (e.g. Yu et al., 2009). The Yichang region has also been shown to have outcrops dated to 1900–2050 Ma (e.g. Zhang et al., 2006).

All zircon grains with ages of 1800–2000 Ma are likely to have been transported from the NCC, since the southern SCC shows no evidence of erosion during this time (e.g. Yan et al., 2011). Additionally, modern sediment transported from the southern SCC by the Min River contains no zircons in the 1800–2000 Ma age range (Yokoyama et al., 2007). Based on this, it seems most likely that the older grains in this range (1800–2050 Ma) were sourced from the southern margin of the NCC, although minor sources in the SCC, and QD belt cannot be entirely ruled out. The variety of potential source terranes makes it difficult to say whether these grains originated on the NCC or the SCC.

Grains 1200-1550 Ma. – Zircons in this age range are rare (n = 4) (Fig. 7). Outcrops in the Gaoshanhe and Yunmengshan regions of the northern QD belt have been shown to have ages of roughly 1200–1550 Ma (Chen and Fu, 1992). Together with the geographic proximity of the northern QD belt to the *Lotosaurus* Quarry, these dates make the northern QD belt a likely source area for this set of zircon grains, which would imply collision and southward fluvial drainage from the suture zone by the time the bonebed was deposited.

Grains 700-1200 Ma. – Sample 16-1-15-3 yielded 26 grains in this range, and sample 17-1-15-1A yielded nine (Fig. 7). Zircons dated to this time are often associated with the amalgamation and breakup of the Rodinia Supercontinent (e.g. Nance et al., 2014), but

numerous smaller-scale events have also been suggested as possible sources (e.g. Weislogel et al., 2010; Wang et al., 2013). The Jiangnan Orogen in the SCC, the result of an Alps-type collision, has been shown to include many exposures of rock with ages of 800–900 Ma (e.g. Su et al., 2014). Furthermore, the Yangtze Orogeny, which spanned 750–850 Ma and occurred within the SCC, has been suggested as a likely source for zircons in the SCC (e.g. Yan et al., 2011).

Zhou et al. (2016) suggested that older zircons within this age range were derived from the basement rock of the QD belt. Taken together, the available information suggests that the younger zircons (700–950 Ma) were sourced primarily from the Yangtze and Jiangnan orogens and the older zircons (950–1200 Ma) from the nearby QD belt.

Grains 400-650 Ma. – Zircon grains from this time range are often attributed to the assembly of Gondwana, but numerous small-scale events may also have contributed to this zircon population (Nance et al., 2014). Sample 16-1-15-3 yielded 31 zircon grains in this age range, and sample 17-1-15-1A yielded four (Fig. 7). There are many possible source terranes, associated with the Caledonian Orogeny (410–460 Ma) and the Kwangsian Orogeny (400–500 Ma), across the SCC and QD belt (Yan et al., 2011; Su et al., 2014).

Additional potential sources for these zircons include numerous intrusions and granitoids with ages of 400-650 Ma known from the QD belt, as well as a similarly-aged tuff in the SCC (Zhou et al., 2004, 2016). Assessing the exact provenance of the grains is difficult at the present time given that all these terranes are potential sources within the regional watershed, and that multiple sources may have contributed zircons to the sample.

Grains 350-400 Ma. – Sample 16-1-15-3 yielded 10 grains with ages from 350–400 Ma, and sample 17-1-15-1A yielded six (Fig. 7). Between 350 and 450 Ma, a nearby subduction event between the northern and southern QD belts led to the closure of the Shangdan Ocean, producing ophiolites (the Shangdan belt) and granitoids (the Piaochi plutons; e.g. Dong et al., 2011). Furthermore, an accretionary wedge complex known from the Liuling and Sujiahe regions has been dated to 310–400 Ma (Weislogel et al., 2010). Zircons in this sample could have been sourced from any of these terranes. However, the fact that the terranes are all roughly within the QD belt suggests connectivity between the two landmasses and southward fluvial transport.

Grains 200-350 Ma. – Zircon grains with ages of 200–350 Ma can generally be attributed to magmatism that occurred during the assembly of Pangea (Nance et al., 2014). In sample 16-1-15-3 there were 41 grains in this age range, and the YSG was determined to be 231.6 Ma (Fig. 7). In sample 17-1-15-1A there were 14 grains in this age range, and the YSG was determined to be 248.5 Ma (Fig. 7). Granitic plutons in the QD belt (225–307 Ma; Zhou et al., 2016) and throughout the Songpan-Ganzi complex (230–250 Ma; Weislogel et al., 2010) are possible sources for these grains. Rifting also occurred in the Songpan-Ganzi complex from 250–280 Ma (Weislogel et al., 2006). Some exposures in the south QD belt have also been shown to be 300–345 Ma old (Weislogel et al., 2010). Lastly, Zhang et al. (2015) concluded that it was unlikely that source rocks for sediments deposited on the northern part of the SCC in the Triassic were located south of the depocenters, and that the sediments came only from northern and eastern source areas. Therefore, the most likely source for the Triassic sediments is the southern part of the QD belt.

The Sangzhi region experienced uplift during the Late Triassic, supplying sediment to more southerly parts of the SCC and blocking sediment transport from the southern part of the NCC (Zhang et al., 2015). This is thought to have occurred following the closure of the Tethys Sea and the collision between the NCC and SCC, which allowed for the exchange of sediment and terrestrial organisms between the NCC and SCC (Su et al., 2014). Previous studies based on zircon analysis of metamorphic basement rock suggest collision between 258.6 ± 6 Ma and 243 ± 5 Ma, coincident with the Indosinian Orogeny (e.g., Niu et al.,

2011). However, our lower intercept age range for the *Lotosaurus* Quarry is 238.9–229.3 Ma. The minimal overlap between the suspected collision date and our estimates for the deposition of the *Lotosaurus* Quarry supports the interpretation that the Quarry formed after a connection had been made between the NCC and the SCC

Supplementary Table 1. Measurements of excavated bonebed elements

Grid	Element	Identification	Orientation	Length (cm)	Angle (°)
R1C1					
R1C2	1	Rib		15	170
	2	Rib		4	150
R1C3	1	Rib		15	180
R1C4	1	Tibia		26	165
R2C1	1	Scapula	Right	36	30
R2C2	1	Rib		40	55
R2C3	1	Centrum			
	2	Fibula	Left	27	45
	3	Rib		19	115
	4	Sacrum+Ilium	Right Ilium	21	140
R2C4	1	Ribs+Vertebrae		70	60
	2	Interclavicle		30	145
	3	Ulna		19	145
	4	Tibia		8	55
	5	Centrum		5	
	6	Pubis	Left	24	67
R2C5	1	Femur	Left	34	150
	2	Rib		27	170
	3	Ulna		25	50
	4	Scapulocoracoid	Left	43	155
R2C6					
R3C1					
R3C2	1	Femur	Left	42	40
	2	Ischium	Left	30	150
	3	Rib		15	30
	4	Rib		10	30
	5	Rib		9	30
	6	Rib		12	30
	7	Rib		17	30
	8	Rib		18	30
	9	Fibula		26	74
	10	Tibia		15	74
R3C3	1	Rib		43	90
R3C4	1	Coracoid	Right	20	165
	2	Rib		27	120
	3	Rib		12	
	4	Rib		35	90
	5	Long bone		5	65
R3C5	1	Rib		25	140
	2	Rib		12	20
	3	Rib		14	20
	4	Rib		17	160
	5	Rib		10	165

R3C6	1	Tibia		27	75
	2	Femur	Right	41	20
	3	Ulna		14	80
	4	Metacarpal/Metatarsal		10	70
	5	Metacarpal/Metatarsal		8	90
	6	Vertebra			
	7	Scapula	Left	31	90
	8	Scapula+Coracoid	Right	40	35
	9	Gastralia		10	0
	10	Fibula		17	50
	11	Rib Fragment		27	50
	12	Vertebra		6	170
	13	Vertebra		16	15
	14	Gastralia		7	180
R3C7	1	Scapula	Left	36	110
	2	Ulna		18	135
	3	Rib		22	160
	4	Humerus	Right	24	85
	5	Scapula		31	85
	6	Rib		43	115
	7	Caudal Vertebrae		19	175
	8	Rib		34	60
	9	Gastralia(5-6,parallel)		10	7
	10	Pubis			
	11	Flat Fragment		10	
	12	Metacarpal/Metatarsal		7	150
	13			2	
	14	Metacarpal/Metatarsal		10	150
	15	5th Metatarsal		4	
	16	Rib		17	170
R3C8	1	Rib		17	18
	2	Rib		14	24
	3	Coracoid	Right	20	32
	4	Radius		23	92
	5	*Indet*			
	6	Metacarpal/Metatarsal		10	160
	7	Metacarpal/Metatarsal		9	0
	8	Metacarpal/Metatarsal		10	30
	9	Phalanx		3	25
	10	Phalanx		4	40
	11	Phalanx		3	40
	12	Metacarpal/Metatarsal		10	65
	13	Metacarpal/Metatarsal		9	65
	14	Phalanx		3	
R3C9					
R3C10					
R3C11					

R3C12	1	Ulna	Right	25	150
	2	Qudratojugal	Left	13	
	3	Rib		23	140
R4C1					
R4C2	1	Rib		18	90
	2	Fragment		10	175
	3	Long bone		11	175
	4	Coracoid	Right	20	130
	5	Radius	Right	22	65
	6	Ulna	Right	25	65
	7	Tibia		24	35
	8	Pubis		18	45
	9	Scapula	Right	14	120
R4C3	1	Vertebrae(2)		10	170
	2	Radius		25	105
	3	Coracoid		20	105
R4C4	1	Ulna	Right	19	5
	2	Rib		11	175
	3	Rib		32	179
	4	Rib		17	170
	5	Vertebrae(2)		7	10
	6	Calcaneum	Right	7	
	7	Centrum		4	
	8	Centrum		4	
	9	Rib		9	40
R4C5	1	Centrum		4	
	2	Centrum		4	
	3	Femur	Right	18	
	4	Centrum		3	
	5	Rib		30	170
	6	Fibula	Right	28	
	7	Rib		14	150
	8	Rib		24	80
	9	Femur		23	10
	10	Vertebra		6	
R4C6	1	3 Metatarsal+2 Phalanges		9,8,7	170
	2	Rib		10	15
	3	Rib		10	90
	4	Rib		39	5
	5	Rib		28	170
	6	Rib		29	100
	7	Rib		40	40
	8	Rib		34	40
	9	Rib		39	50
	10	Rib		20	35
	11	Rib		42	15
	12	Rib		39	15

	13	Rib		33	75
	14	Rib		16	80
	15	Rib		27	65
	16	Rib		22	35
	17	Rib		14	40
	18	Rib		16	80
	19	Rib		7	120
	20	Long bone		6	85
	21	Vertebra			
	22	Coracoid	Left	19	90
	23	Scapula		12	0
	24	Scapula		17	0
	25	Ulna	Left	23	170
	26	Vertebrae(3)		13	165
	27	Metacarpal/metatarsal		3	105
	28	Vertebrae(2)		6	110
	29	Vertebrae with neural spine		39	30
	30	Vertebra		6	
	31	Long bone		9	100
	32	Metacarpal/Metatarsal		9	115
	33	Rib		14	65
	34	Rib		19	45
	35	Scapula			
R4C7	1	Fibula	Left	25	20
	2	Tibia	Left	25	0
	3	Rib		17	140
	4	Metacarpal/Metatarsal		9	5
	5	Rib		36	170
	6	Scapula+Coracoid	Right	19	175
	7	Rib		40	70
	8	Metacarpal/Metatarsal		10	175
	9	Rib		45	50
	10	Metacarpal/Metatarsal		9	145
	11	Metacarpal/Metatarsal		10	50
	12	Fibula	Right	26	35
	13	Fibula	Right	26	165
	14	Femur	Right	39	160
	15	Metacarpal/Metatarsal		9	10
	16	Tibia		86	40
	17	Scapula	Left	23	20
R4C8	1	Ulna		18	50
	2	Long bone		10	50
	3	Scapula		15	90
	4	Ischium	Left	24	170
	5	Femur	Right	40	0
	6	Rib		10	20
	7	Rib		17	170

	8	Rib		40	160
	9	Metarcarpal/Metatarsal		8	0
	10	Ulna	Left	17	170
	11	Interclavicle		19	85
	12	Phalanx		3	70
	13	Metacarpal/Metatarsal		8	0
	14	Gastralia(several)			
R4C9	1	Vertebrae with neural spines		18	25
	2	Rib		10	170
	3	Rib		11	25
	4	Rib		40	0
	5	Long bone		8	160
	6	Coracoid	Right	20	140
	7	Ischium		16	120
	8	Vertebrae(2)		6	80
	9	Metacarpal/Metatarsal		9	15
	10	Astragalus		7	
	11	Metacarpal/Metatarsal		10	10
	12	Metacarpal/Metatarsal		10	10
	13	Tibia		24	170
	14	Fibula	Right	24	135
	15	Fibula	Left	23	155
	16	Rib		14	60
	17	Rib		34	145
	18	Long bone			
R4C10	1	Rib		28	167
	2	Rib		23	163
	3	Rib		15	144
	4	Vertebra with neural spine		19	56
	5	Phalanx		7	5
	6	*Indet*			
	7	Nerual spines		30	130
	8	Rib		17	88
	9	Rib		12	95
	10	Metacarpal/Metatarsal		6	141
	11	Tibia		8	35
	12	Long bone		5	163
	13	Calcaneum	Left	7	153
	14	*Indet*		4	
	15	Metacarpal/Metatarsal		8	128
	16	Metacarpal/Metatarsal		7	130
	17	Metacarpal/Metatarsal		4	60
	18	Metacarpal/Metatarsal		6	60
	19	Phalanx		3	77
	20	Phalanx		3	73
	21	*Indet*		6	8
R4C11	1	Rib		18	54

	2	Rib		30	134
	3	Rib		28	126
	4	Rib		8	51
	5	Rib		38	33
	6	Scapulocoracoid	Left	28	26
	7	Mandible	Left	22	80
	8	Rib		30	165
	9	Rib		29	30
R4C12	1	Interclavicle		26	57
	2	Phalanx		4	170
	3	Ulna		24	45
	4	Centrum		6	28
	5	Metacarpal/Metatarsal		10	160
	6	Humerus	Left	28	170
	7	Tibia+Astragalus	Right	34	118
	8	Ulna	Right	24	57
	9	Rib		10	104
	10	Humerus	Left	27	40
	11	Rib		18	10
	12	Rib		23	55
	13	Rib		7	65
R4C13	1	Rib		37	50
	2	Rib		14	100
	3	Rib		17	115
	4	Rib		14	85
R4C14	1	Scapula+Coracoid	Right	43	60
	2	Ischia(pair)		30	50
R5C1					
R5C2	1	Femur		26	50
R5C3	1	Foot and Crus	Left	43	145
	2	Radius		22	135
	3	Ulna	Right	22	25
	4	Radius	Right	22	25
	5	Centrum			
	6	Centrum			
R5C4	1	Gastralia(15-20)		19	50
	2	Vertebrae(2)		6	10
	3	Rib		27	170
	4	Rib		33	25
	5	Rib		50	160
	6	Scapula		11	
	7	Metacarpal/Metatarsal		9	40
	8	Rib		11	50
	9	*Indet*		14	30
	10	Coracoid	Right	20	0
	11	Phalanx		3	
	12	Phalanx		3	

R5C5	1	Fibula	Left	25	115
	2	Vertebrae(3)		9	115
	3	Vertebra with neural spine		26	79
	4	Rib		31	76
	5	Vertebra with neural spine		25	60
	6	Ribs		41	25
	7	Vertebrae with neural spines(2)		23	40
	8	Rib		27	10
	9	Rib		14	60
	10	Ischia(pair)		30	40
	11	Chevron		8	90
	12	Rib		13	0
	13	Ilia (pair)		25	
	14	Ribs		33	60
	15	Metacarpal/Metatarsal		8	130
	16	Metacarpal/Metatarsal		9	155
	17	Surangular		7	40
R5C6	1	Frontal		12	
	2	Interclavicle		26	140
	3	Fibula		26	105
	4	*Indet*		9	
	5	Humerus		22	165
	6	Coracoid	Right	17	0
	7	Scapula	Right	16	
	8	*Indet*			
	9	Humerus	Left	24	85
	10	Rib		31	135
	11	Rib		37	165
	12	Phalanx		3	
	13	Caudal Vertebrae		20	0
	14	Scapula		7	100
	15	Scapula	Right	30	40
	16	Interclavicle		20	20
	17	Rib		24	35
	18	Rib		7	155
	19	Rib		16	10
	20	Metacarpal/Metatarsal		6	145
	21	Humerus	Left	25	175
	22	Tibia		24	0
	23	Ulna	Right	22	25
	24	Rib		8	30
	25	Metacarpal/Metatarsal		6	80
	26	Calcaneum		11	165
	27			8	165
	28	Metacarpal/Metatarsal		5	150
	29	Phalanx		4	135
R5C7	1	Scapula	Right	35	65

	2	Radius		27	87
	3	Femur		33	90
	4	Radius		26	44
	5	Rib		18	17
	6			33	113
	7	Rib		28	13
	8	Neural spines(3)		24	115
	9	Tibia		25	34
	10	Femur	Left	30	5
	11	Rib		29	140
	12	Tibia		23	137
	13	Femur	Left	41	2
	14	Scapula	Left	25	150
	15	Metacarpal/Metatarsal		7	120
	16	Carpal		4	
	17	Rib		18	175
	18	Rib		35	110
	19	Rib		35	125
	20	Rib		26	150
	21	Rib		18	135
	22	Rib		29	145
	23	Phalanx		3	
	24	5th Metatarsal		5	
	25	Long bone			
	26	Long bone		9	30
R5C8	1	Vertebrae with neural spines		47	98
	2	Scapula	Right	33	85
	3	Vertebrae with neural spines		41	30
	4	Femur		21	145
	5	Ulna	Left	24	15
	6	Rib		26	145
	7	Metacarpal/Metatarsal		9	160
	8	Caudal Vertebrae		14	17
	9	Tibia		26	131
	10	Femur	Left	42	150
	11	Rib		16	50
	12	Metacarpal/Metatarsal		9	90
	13	*Indet*			
	14	Rib		11	50
	15	Vertebrae(2/3)		8	
	16	Rib		10	20
	17	Carpal		3	
	18	*Indet*		4	
R5C9	1	Humerus	Right	24	174
	2	Rib		22	143
	3	Fibula	Right	24	170
	4	Phalanx		4	0

	5	Rib		15	145
	6	Rib		13	10
	7	Lower jaw(partial)		18	170
	8	Lower jaw(pair)		26	10
	9	Scapula+Coracoid	Left	40	135
	10	Rib		9	25
	11	Metacarpal/Metatarsal		8	20
	12	Occipital condyle		5	
	13	Rib		20	120
	14	Metacarpal/Metatarsal		6	35
	15	Astragalus	Right	7	
	16	Rib		39	10
	17	Rib		32	60
	18	Phalanx		4	170
R5C10	1	Metacarpal/Metatarsal		6	72
	2	Metacarpal/Metatarsal		6	75
	3	Metacarpal/Metatarsal		5	80
	4	Radius		22	176
	5	Rib		16	127
	6	Rib		15	115
	7	Rib		43	75
	8	Rib		28	118
	9	Phalanx		6	40
	10	Metacarpal/Metatarsal		8	5
	11	Phalanx		2	175
	12	Rib		19	80
	13	Phalanx		4	15
	14	Metacarpal/Metatarsal		9	162
	15	Metacarpal/Metatarsal		9	162
	16	Scapula	Right		154
	17	Scapula	Left		10
	18	Fibula	Right		18
	19	Rib		25	45
	20	Scapula	Right	33	102
	21	Radius		25	25
	22	Tibia		25	95
	23	Rib		23	111
	24	Astragalus		8	
	25	Astragalus		6	
	26	Tibia		24	15
	27	*Indet*		6	
	28	Scapula	Left	11	93
	29	Tibia		24	119
	30	Neural spine(4)		13	40
	31	Rib		31	167
	32	Rib		33	167
R5C11	1	Astragalus	Right	7	

	2	Pubis		6	85
	3	Vertebrae with neural spines		28	0
	4	Astragalus		7	
	5	Coracoid	Left	20	138
	6	Carpal/Tarsal		4	
	7	Calcaneum	Right	8	178
	8	Pubis(pair)		28	142
	9	Rib		14	80
	10	Rib		20	170
	11	Rib		16	170
	12	Rib		20	85
	13	Metacarpal/Metatarsal		5	70
	14	Metacarpal/Metatarsal		3	10
R5C12	1	Metacarpal/Metatarsal		10	160
	2	Phalanx		2	
	3	*Indet*		2	
R6C1					
R6C2					
R6C3	1	*Indet*		40	
	2	Rib		3	20
	3	Rib		10	50
	4	Rib		18	50
	5	Metacarpal/Metatarsal		9	20
	6	Rib		25	45
	7	Rib		24	20
	8	Calcaneum	Left	7	
	9	Tarsal(digit4)		4	
	10	Tarsal(digit3)		2	
	11	Calcaneum	Right	8	
	12	*Indet*		6	
	13	Metacarpal/Metatarsal		6	130
R6C4	1	Scapula	Left	27	150
	2	Rib		47	50
	3	Scapula	Left	33	20
	4	Rib		19	120
	5	Coracoid		19	50
	6	Rib		12	10
	7	Rib		23	165
	8	Ribs(3)		55	50
	9	Rib		39	125
	10	Rib		37	40
	11	Rib		30	15
	12	Rib		19	30
	13	Ulna		23	70
	14	Long bone		22	125
	15	Humerus		27	60
	16	Scapula	Right	33	60

	17	Coracoid	Left	18	35
	18	Rib		30	125
	19	Rib		25	90
	20	Vertebra		5	
R6C5	1	Phalanx		3	
	2	Metacarpal/Metatarsal		4	70
	3	Metacarpal/Metatarsal		8	60
	4	Rib		28	80
	5	Rib		22	80
	6	Neural spines		14	110
	7	Vertebrae(2)		7	5
	8	Scapula		22	80
	9	Scapula			58
	10	Fibula		23	20
	11	Radius		19	175
	12	Radius		21	20
	13	Tibia+Astragalus		28	0
	14	Scapula	Right	28	0
	15	Phalanx		5	20
	16	Long bone		4	
	17	Rib		34	5
	18	Metacarpal/Metatarsal		8	175
	19	Rib		16	20
	20	Coracoid		18	120
R6C6	1	Cervical Rib		8	35
	2	Humerus(distal end)		11	30
	3			9	
	4	Metacarpal/Metatarsal		6	5
	5	Astragalus	Left	6	
	6	Rib		9	155
	7	Vertebrae with neural spines		78	45
	8	Rib		23	0
	9	Rib		32	30
	10	Rib		26	40
	11	Rib		16	70
	12	Rib		32	60
	13	Rib		40	85
	14	Scapula	Left	31	40
	15	Rib		24	110
	16	Rib		12	155
	17	Rib		20	155
	18	Tibia		13	165
	19	Ulna	Right	9	175
	20	Metacarpal/Metatarsal		8	25
R6C7	1	Scapula+Coracoid	Right	34	80
	2	Scapula	Left	21	125
	3	Vertebrae with neural spines		35	90

	4	Calcaneum	Left	8	58
	5	Scapula+Coracoid	Right	38	156
	6	Rib		14	152
	7	Rib		16	140
	8	Rib		13	172
	9	Rib		9	4
	10	Metacarpal/Metatarsal		8	157
	11	Carpal		3	
	12	Scapula	Right	31	23
	13	Ischia(pair)		28	154
	14	Rib		32	5
	15	Vertebrae with neural spines		26	100
	16	Vertebrae with neural spines		25	70
	17	Rib		36	5
	18	Rib		25	67
	19			15	0
	20	Ulna		20	165
	21	Metacarpal/Metatarsal		9	165
	22	Centrum		4	
	23	Centrum		4	
	24	Ribs(2)		29	70
	25	Vertebrae w. neuralspines(2)		30	80
	26	Vertebrae w. neural spines(4)		21	76
R6C8	1	Rib		21	53
	2	Rib		12	35
	3	Rib		24	38
	4	Rib		9	72
	5	Rib		13	83
	6	Rib		29	3
	7	Ribs(2)		25	62
	8	Scapula		13	
	9	Sternal		10	
	10	Metacarpal/Metatarsal		10	55
	11	Radius		12	40
	12	Long bone		5	128
	13	Fibula	Right	24	38
	14	Humerus	Left	28	30
	15	Femur	Left	36	15
	16	Radius		28	60
	17	Vertebra		27	175
	18	Rib		39	60
R6C9	1	Femur	Left	37	165
	2	Astragalus	Left	6	
	3	Phalanx		4	40
	4	Phalanx		2	
	5	Calcaneum	Left	8	
	6	Rib		17	175

	7	Metacarpal/Metatarsal		10	165
	8	Rib		9	30
	9	Scapula+Coracoid		29	155
	10	Ischia(pair)		19	155
	11	Vertebrae with neural spines		100	140
	12	Pubis	Left		
	13	Long bone		8	
	14	Caudal Vertebrae		87	60
R6C10	1	Fibula	Right	22	126
	2	Tibia		27	136
	3	Rib		16	123
	4	*Indet*		4	
	5	Tibia		26	132
	6	*Indet*		8	
	7	Metacarpal/Metatarsal		8	25
	8	Metacarpal/Metatarsal		9	122
	9	Fibula		28	92
	10	Femur(distal end)		9	
	11	Phalanx		2	75
	12	*Indet*			
	13	Metacarpal/Metatarsal		7	137
	14	Vertebrae with neural spines(3)		14	100
	15	Humerus	Left	26	175
	16	Tibia		26	165
	17	Pubis	Left	26	155
	18	Metacarpal/Metatarsal		10	35
	19	Phalanx		2	
	20	Phalanx		3	
	21	Carpal		3	
	22	*Indet*		7	89
R6C11	1	Ischium	Right	30	70
	2	Long bone		13	59
	3	Ischia(broken pair)		10	
	4	Metacarpal/Metatarsal		7	27
	5	*Indet*		6	
	6	Metacarpal/Metatarsal		6	120
	7	Phalanx		3	
	8	Phalanx			
	9	Metacarpal/Metatarsal		5	170
	10	Metacarpal/Metatarsal		9	173
R6C12	1	Femur	Right	28	170
	2	Rib		3	150
	3	Rib		8	0
	4	Rib		5	0
	5	Rib		4	20
R7C1					

R7C2					
R7C3					
R7C4	1	Vertebrae w. neural spines(4-5)		19	53
	2	Vertebra with neural spine		16	148
	3	Metacarpal/Metatarsal		6	5
	4	Fibula	Right	23	24
	5	Rib		15	24
	6	Metacarpal/Metatarsal		9	140
	7	Metacarpal/Metatarsal		3	
	8	Scapula		14	
	9	Humerus	Left	26	15
	10	Pubis	Right	27	15
	11	Femur	Right	27	22
	12	Rib		20	40
	13	Fibula		23	51
	14	Ulna	Left	22	16
	15	Rib		31	60
	16	Fibula	Right	20	168
	17	Femur	Right	26	55
	18	Humerus	Left	24	37
	19	Ischium	Left	31	40
	20	Metacarpal/Metatarsal		7	43
	21	Rib		5	65
	22	Rib		33	65
	23	Scapula+Coracoid	Left	35	70
	24	Humerus	Right	34	90
	25	Pubis		30	75
R7C5	1	Vertebrae with neural spines(2)		32	80
	2	Ribs		30	80
	3	Rib		12	100
	4	Pubis	Right	29	15
	5	Scapula+Coracoid	Left	41	5
	6	Vertebrae with neural spines(4)		20	130
	7	Rib		18	60
	8	Rib		22	130
	9	Rib		21	50
	10	Coracoid	Right	20	15
	11	Fibula	Right	23	175
	12	Vertebrae with neural spines(5)		23	145
R7C6	1	Rib		48	2
	2	Rib		38	174
	3	Long bone		16	44
	4	Ribs(7)		30	160

	5	Rib		40	153
	6	Humerus	Left	14	
	7	Phalanx		20	
	8	Scapula		26	13
	9	Long bone		8	
R7C7	1	Caudal vertebrae with chevron		70	10
	2	Rib(nearly complete)		24	26
	3				
	4	Femur	Right	36	153
	5	Fibula	Right	25	120
	6	Fibula+Calcaneum	Right	29	30
	7	Tibia+Fibula	Left	24	30
	8	Rib		34	33
	9	Coracoid		14	
	10	Gastralia		14	
	11	Rib		15	100
	12	Rib		34	4
	13	Gastralia		5	70
R7C8	1	Scapula+Coracoid	Right	43	80
	2	Radius		25	90
	3	Metacarpal/Metatarsal		8	0
	4	Metacarpal/Metatarsal(2)		9	120
	5	Metacarpal/Metatarsal		10	20
	6	Phalanx		3	
	7	Phalanges(2)		2	
	8	Phalanx		2	
	9	Tibia		24	0
	10	Rib		28	25
	11	Rib		9	75
	12	Scapula	Left	26	105
	13	Fibula		23	0
	14	Metacarpal/Metatarsal		10	175
	15	Fibula		16	75
	16	Rib		28	155
	17	Coracoid		11	
R7C9	1	Humerus	Right	26	20
	2	Tibia		23	10
	3	Radius		22	165
	4	Vertebra		4	
	5	Coracoid		20	110
	6	Radius		23	85
	7	Rib		20	170
	8	Humerus		11	100
	9	Ribs(2)		20	145
	10	Astragalus		8	
	11	Femur	Left	39	160

	12	Skull Fragment		6	
	13	Long bone		17	0
	14	Vertebral spines(2)		13	40
	15	Long bone(Incomplete)		5	
	16	Centrum		6	
	17	Phalanx		5	
R7C10	1	Femur	Left	41	55
	2	Rib		23	165
	3	Tibia		26	75
	4	Calcaneum		7	
	5	Rib		34	55
	6-7	Phalanges		2	
	8	Rib		32	30
	9	Ribs(3)		26	60
	10	Vertebral column		35	95
	11	Phalanx		2	
	12	Rib		38	105
	13	Neural spine		11	175
	14	Calcaneum		7	
R8C1					
R8C2					
R8C3					
R8C4	1	Caudal vertebrae		13	
	2				
R8C5	1	Scapula+Coracoid		37	35
	2	Humerus(incomplete)		10	
	3	Rib		24	
	4	Scapula		30	65
	5	Humerus		10	
	6	Rib(2)		15	15
	7	Limb bone		15	40
R8C6	1	Humerus		18	135
	2	Long bone		11	65
	3	Tibia+Fibula /Ulna+Radius		7	
	4	Gastralia		9	145
	5	Ribs(3+)		16	25
	6	Metacarpal/Metatarsal		0	145
	7	Metacarpal/Metatarsal		0	15
	8	Scapula	Left	26	25
	9			21	75
	10	Humerus		12	
	11	Femur		34	10
	12	Fibula		23	110
	13	Fibula		18	170
	14	Metacarpal/Metatarsal		8	155
	15	Rib		22	70

R8C7	1	Skull Fragment		15	
	2	Vertebral column with ribs		70	5
	3	Rib		30	75
	4	Limb bone(Fragment)		6	
	5	Scapula(incomplete)		26	70
	6	Fibula		27	30
	7	Rib		21	110
	8	Humerus		10	150
	9	Rib		21	110
	10	Cervical vertebrae with ribs(5)		30	80
	11	Metacarpal/Metatarsal		10	170
R8C8	1	Rib		41	5
	2	Rib		23	70
	3	Femur	Left	39	35
	4	Femur	Right	39	20
	5	Tibia	Left	27	35
	6	Ribs		18	20
	7	Fibula		20	53
	8	Fibula		25	175
	9	Femur		10	
	10	Ischia		19	10
	11	Rib		40	125
	12	Centrum		6	
	13	Rib		7	95
	14	Rib		11	0
	15	Fibula		12	140
	16	Clavicle		17	140
	17	Metacarpal/Metatarsal		5	
	18	Long bone		10	20
	19	Claw		4	
R9C1					
R9C2					
R9C3					
R9C4	01	Tibia		27	20
	02	Rib		6	
R9C5	01	Fibula	Right	27	70
	02	Ulna	Right	25	70
	03	Rib		27	60
	04	Rib		24	80
	05	Humerus	Right	14	40
	06	Humerus		17	30
	07	Radius		20	10
	08	Ulna		22	10
	09	Metacarpal/Metatarsal		8	9
	10	Metacarpal/Metatarsal		8	20

	11	Rib		21	35
	12	Phalanx		4	
	13	Metacarpal/Metatarsal		6	134,86
	14	Fragment		8	
	15	Fragment		9	
	16	Long bone		13	178
R9C6	1	Tibia		25	130
	2	Astragalus			
	3	Metacarpal/Metatarsal		10	5
	4	Metacarpal/Metatarsal		8	90
	5	Metacarpal/Metatarsal		8	120
	6	Metacarpal/Metatarsal		9	
	7	Scapula	Right	30	50
	8	Pubis	Right	28	165
	9	Femur	Left	39	170
	10	Fibula	Left	11	115
	11	Tibia	Left	23	140
	12	Metacarpal/Metatarsal		8	8
	13	Rib		46	50
	14	Rib(Incomplete)		11	170
	15	Coracoid	Right	20	14
	16	Rib		9	10
R9C7	1	Rib		31	10
	2	Metacarpal/Metatarsal		10	5
	3	Metacarpal/Metatarsal		8	5
	4	Metacarpal/Metatarsal		10	13
	5	Metacarpal/Metatarsal		8	166
	6	Metacarpal/Metatarsal		10	70
	7	Metacarpal/Metatarsal		9	30
	8	Metacarpal/Metatarsal		9	30
	9	Metacarpal/Metatarsal		8	58
	10-18	Phalanges		4	
	19	Scapula	Left	30	22
	20	Scapula	Left	30	168
	21	Femur	Left	38	176
	22	Fibula	Left	23	166
	23	Radius	Right	22	18
	24	Ulna	Right	23	35
R9C8	1	Ulna		24	25
	2	Scapula	Right	30	27
	3	Vertebrae		35	80
	4	Bone fragment		5	
	5	Scapula		10	
	6	Scapula		10	
	7	Ischia	Left+Right	32	78
	8	Ribs		11	44
	9	Scapulocoracoid	Right	39	48

	10	Radius	Right	24	92
	11	Neural spine		11	
	12	Rib		20	165
	13	Femur	Left	39	102
	14	Scapulocoracoid	Left	38	58
	15	Pubis	Left	31	30
	16	Neural spine			
	17	Bone fragment		10	
R10C1					
R10C2					
R10C3					
R10C4					
R10C5					
R10C6	1	Scapula+Coracoid	Right	21	53
	2	Rib(Incomplete)		20	
	3	Rib head		9	
	4	Rib(Incomplete)		10	170

Analysis	176Lu/177 Hf	±	176Hf/177Hf	±	Age (Ma)	e^λt - 1	Initial 176/177Hf	εHf (t = now)	εHf (t = age)	± in εHf units	Model Age DM
C216153-3	0.001540	0.000035	0.282695	1.01E-05	247.2	4.63E-03	2.8269E-01	-3.2	2.1	0.4	800.2
C216153-8	0.001050	0.000019	0.281873	1.20E-05	300.2	5.62E-03	2.8187E-01	-32.3	-25.8	0.4	1939.9
C216153-10	0.000885	0.000018	0.281368	6.95E-04	307.6	5.76E-03	2.8136E-01	-50.1	-43.5	24.7	2621.8
C216153-31	0.000951	0.000014	0.281792	1.05E-05	978.8	1.84E-02	2.8177E-01	-35.1	-13.8	0.4	2045.3
C216153-34	0.000603	0.000011	0.282220	1.06E-05	249.6	4.67E-03	2.8222E-01	-20.0	-14.5	0.4	1440.2
C216153-36	0.000540	0.000014	0.281742	1.10E-05	963.1	1.81E-02	2.8173E-01	-36.9	-15.7	0.4	2091.9
C216153-38	0.000807	0.000015	0.282348	6.53E-05	623.8	1.17E-02	2.8234E-01	-15.4	-1.9	2.3	1269.8
C216153-39	0.000713	0.000024	0.281982	1.05E-04	1222	2.31E-02	2.8197E-01	-28.4	-1.6	3.7	1772.1
C216153-75	0.001491	0.000028	0.282144	1.15E-05	416.4	7.80E-03	2.8213E-01	-22.7	-13.8	0.4	1581.1
C216153-76	0.002067	0.000056	0.282581	1.92E-04	240.3	4.50E-03	2.8257E-01	-7.2	-2.2	6.8	977.2
C216153-88	0.003199	0.000107	0.282844	1.42E-05	303	5.67E-03	2.8283E-01	2.1	8.2	0.5	614.2
C216153-89	0.001262	0.000015	0.282413	1.73E-05	506.2	9.50E-03	2.8240E-01	-13.1	-2.3	0.6	1193.1
C216153-90	0.001542	0.000013	0.282059	1.05E-05	367	6.88E-03	2.8205E-01	-25.7	-17.9	0.4	1703.6
C216153-91	0.001070	0.000016	0.282680	3.72E-05	436.7	8.19E-03	2.8267E-01	-3.7	5.7	1.3	811.9
C216153-93	0.001219	0.000023	0.282391	3.39E-04	246.5	4.61E-03	2.8239E-01	-13.9	-8.6	12.0	1222.9
C216153-94	0.000955	0.000006	0.282269	1.00E-05	277.1	5.19E-03	2.8226E-01	-18.3	-12.3	0.4	1385.7
C216153-95	0.001410	0.000042	0.282444	1.72E-05	479.4	8.99E-03	2.8243E-01	-12.1	-1.8	0.6	1154.8

Sample #	Preferred Age	± Ma
161153-37	225.6	2.64
161153-17	231.6	2.78
161153-43	233.4	3.16
161153-143	240.3	2.88
161153-55	241.9	3.67
161153-160	246.5	2.52
161153-39	247.1	2.81
161153-70	247.2	2.66
161153-101	249.6	2.20
161153-28	253.3	3.21