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Supplemental Material

Table S1. Our and published low-temperature thermochronological data from the Qiangtang Terrane.

Table S2. Sample details.

TABLE S1. OUR AND PUBLISHED LOW-TEMPERATURE THERMOCHRONOLOGICAL DATA FROM THE QIANGTANG TERRANE.

Sample	Location	Lat.	Long.	Lithology (Age–constraints)	Method	Age±1σ(Ma)		P(χ^2)	Reference
SD003FT1	SQT	32.74	88.71	Sandstone (J_3 K_1)	AFT	83	6	99.3	(Wang and Wei, 2013)
SD023FT1	SQT	32.74	88.71	Sandstone (J_3 K_1)	AFT	88	5	67	(Wang and Wei, 2013)
SD023FT2	SQT	32.74	88.71	Sandstone (J_3 K_1)	AFT	63	4	98	(Wang and Wei, 2013)
SD029FT1	SQT	32.74	88.71	Sandstone (J_3 K_1)	AFT	117	8	99.6	(Wang and Wei, 2013)
SD037FT2	SQT	32.74	88.71	Sandstone (J_3 K_1)	AFT	130	9	99.4	(Wang and Wei, 2013)
SD037FT3*	SQT	32.74	88.71	Sandstone (J_3 K_1)	AFT	160	11	96.9	(Wang and Wei, 2013)
G001R1*	SQT	32.28	92.13	Granite (T_3)	AFT	87.2	6.3	<0.1	(Ren et al., 2015)
P0209R2	SQT	32.50	88.27	Sandstone (T_3)	AFT	35	0.2	>99	(Ren et al., 2015)
P0214R1	SQT	32.50	88.27	Sandstone (T_3)	AFT	25.7	2.9	>30	(Ren et al., 2015)
P0529R1	SQT	32.50	88.27	Sandstone (T_3)	AFT	101.6	2.2	>20	(Ren et al., 2015)
PB21–R*	SQT	32.72	91.40	Sandstone (T_3)	AFT	77.8	5.5	<2	(Ren et al., 2015)
PB49–R25	SQT	32.72	91.40	Sandstone (T_3)	AFT	22.6	2.4	>90	(Ren et al., 2015)
PK2	SQT	32.03	91.71	Orthogneiss (166 Ma)	AFT	74.4	3	51.1	(Rohrmann et al., 2012)
PK3A	SQT	32.12	91.71	Granite (852 Ma)	AFT	71.9	3.1	54.5	(Rohrmann et al., 2012)
PK3A	SQT	32.12	91.71	Granite (852 Ma)	AHe	54.4	0.6		(Rohrmann et al., 2012)
A–016–1	SQT	32.30	84.00	Volcanics (K_1)	AFT	62	5	99.2	(Yu et al., 2018)
A–033–1	SQT	32.30	84.00	Volcanics (K_1)	AFT	44	3	69.3	(Yu et al., 2018)
A–035–2	SQT	32.35	83.55	Volcanics (K_1)	AFT	77	6	92.8	(Yu et al., 2018)
A–035–3	SQT	32.35	83.55	Volcanics (K_1)	AFT	35	2	93.3	(Yu et al., 2018)
A–033–1*	SQT	32.30	84.00	Volcanics (K_1)	ZFT	77	7	0	(Yu et al., 2018)
A–035–2*	SQT	32.30	84.00	Volcanics (K_1)	ZFT	83	7	0	(Yu et al., 2018)
A–035–3	SQT	32.35	83.55	Volcanics (K_1)	ZFT	78	3	12.8	(Yu et al., 2018)
Ep1504–09	SQT	32.73	90.62	Sandstone (K_2)	AFT	48.9	3.5	22.6	(Zhang et al., 2019)
Ep1504–17	SQT	32.73	90.62	Sandstone (K_2)	AFT	68	4.8	2.5	(Zhang et al., 2019)
080406–RZ1	SQT	32.28	86.71	Sandstone (J_{1-2})	AFT	66.7	3.9	34.7	(Zhao et al., 2020)

080602–RZ1	SQT	32.26	86.93	Sandstone (T_3)	AFT	75.8	5.7	17.9	(Zhao et al., 2020)
081001–RZ1	SQT	32.36	87.14	Granite (K_1)	AFT	84	5.6	51.6	(Zhao et al., 2020)
080406–RZ1	SQT	32.28	86.71	Sandstone ($J_{1\text{-}2}$)	AHe	58	6		(Zhao et al., 2020)
080602–RZ1	SQT	32.26	86.93	Sandstone (T_3)	AHe	83	10		(Zhao et al., 2020)
080603–RZ1	SQT	32.27	86.93	Sandstone (T_3)	AHe	51	4		(Zhao et al., 2020)
081001–RZ1	SQT	32.36	87.14	Granite (K_1)	AHe	85	6		(Zhao et al., 2020)
081007–RZ1	SQT	32.28	87.07	Sandstone (T_3)	AHe	98	6		(Zhao et al., 2020)
080302–RZ1	SQT	32.45	86.63	Sandstone ($J_{1\text{-}2}$)	ZHe	100	7		(Zhao et al., 2020)
080305–RZ1	SQT	32.45	86.63	Sandstone ($J_{1\text{-}2}$)	ZHe	97	21		(Zhao et al., 2020)
080406–RZ1	SQT	32.28	86.71	Sandstone ($J_{1\text{-}2}$)	ZHe	106	22		(Zhao et al., 2020)
080602–RZ1	SQT	32.26	86.93	Sandstone (T_3)	ZHe	107	5		(Zhao et al., 2020)
080603–RZ1	SQT	32.27	86.93	Sandstone (T_3)	ZHe	109	3		(Zhao et al., 2020)
081001–RZ1	SQT	32.36	87.14	Granite (K_1)	ZHe	87	5		(Zhao et al., 2020)
081007–RZ1	SQT	32.28	87.07	Sandstone (T_3)	ZHe	97	12		(Zhao et al., 2020)
DL2014-96	SQT	32.87	83.53	Tuff (K_1)	AHe	53.8	2.7		(Yang et al., 2019)
DBZ-GS01	SQT	32.84	83.46	Andesite (K_1)	AHe	85.1	4		(Yang et al., 2019)
DL2014-20	SQT	32.83	83.44	Gabbro (K_1)	AHe	58.5	2.6		(Yang et al., 2019)
DL2014-61	SQT	32.78	83.25	Diorite porphyrite (K_1)	AHe	70.7	5.9		(Yang et al., 2019)
DL2014-55	SQT	32.85	83.61	Sandstone (K_1)	AHe	41. 7	9. 8		(Yang et al., 2019)
ZK3204-B1	SQT	32.88	83.51	Andesite (K_1)	AHe	67. 4	4. 1		(Yang et al., 2019)
ZK2420	SQT	32.87	83.51	Andesite (K_1)	AHe	52. 3	4. 4		(Yang et al., 2019)
ZK1620	SQT	32.87	83.51	Andesite (K_1)	AHe	47. 3	2. 1		(Yang et al., 2019)
ZK3228	SQT	32.87	83.51	Andesite (K_1)	AHe	37. 9	2. 5		(Yang et al., 2019)
ZK4804	SQT	32.88	83.51	Granodiorite (k1)	AHe	47. 1	2. 6		(Yang et al., 2019)
DL2014-29	SQT	32.78	83.57	Diorite (K1)	AFT	33	3	93.7	(Yang et al., 2020)
DL2014-41	SQT	32.80	83.59	Quartz diorite (K_1)	AFT	72	5	52.8	(Yang et al., 2020)
DL2014-48	SQT	32.83	83.60	Granodiorite (K_1)	AFT	7.8	1	72.2	(Yang et al., 2020)
DL2014-54	SQT	32.85	83.61	Sandstone (J_1)	AFT	56	4	66.8	(Yang et al., 2020)

DL2014-65	SQT	32.82	83.58	Granodiorite (K_1)	AFT	30	4	98.9	(Yang et al., 2020)
DL2014-85	SQT	32.87	83.50	Andesite (K_1)	AFT	65	5	55.8	(Yang et al., 2020)
RN-GS03	SQT	32.85	83.49	Andesite (K_1)	AFT	61	5	99.9	(Yang et al., 2020)
NR-GS01	SQT	32.87	83.53	Andesite (K_1)	AFT	66	5	87.6	(Yang et al., 2020)
DBZ-GS02	SQT	32.85	83.46	Andesite (K_1)	AFT	63	5	100	(Yang et al., 2020)
ZK3204-B1	SQT	32.88	83.51	Andesite (K_1)	AFT	67	5	9.9	(Yang et al., 2020)
DL2014-25	SQT	32.78	83.56	Granodiorite (K_1)	AHe	45.7	2.1		(Yang et al., 2020)
DL2014-49	SQT	32.83	83.61	Granodiorite (K_1)	AHe	36	1.6		(Yang et al., 2020)
DL2014-81	SQT	32.78	83.32	Granite (K_1)	AHe	52.1	2.5		(Yang et al., 2020)
ZK3204-B1	SQT	32.88	83.51	Andesite (K_1)	AHe	52.3	4.4		(Yang et al., 2020)
080311-RZ1	SQT	32.31	84.68	Granodiorite (118.9 Ma	AFT	55.9	4.6	9	(Li et al., 2022)
080502-RZ1	SQT	32.07	84.03	Granite (160.1 Ma)	AFT	53.4	2.4	0	(Li et al., 2022)
080502-RZ3	SQT	32.07	84.07	Granite (165.5 Ma)	AFT	55	1.9	1	(Li et al., 2022)
081302-RZ1	SQT	32.00	86.37	Sandstone (< 162 Ma)	AFT	72	6	41	(Li et al., 2022)
081304-RZ1	SQT	32.11	86.40	Sandstone (< 162 Ma)	AFT	48.7	8	0	(Li et al., 2022)
081306-RZ1	SQT	32.06	86.37	Sandstone (< 162 Ma)	AFT	55.2	5	1	(Li et al., 2022)
081801-RZ1	SQT	32.06	84.01	Micaschist (< 994 Ma)	AFT	51.8	2.9	15	(Li et al., 2022)
080311-RZ1	SQT	32.31	84.68	Granodiorite (118.9 Ma	AHe	43.6	3.2		(Li et al., 2022)
080402-RZ1	SQT	32.33	84.79	Granodiorite	AHe	34	3.3		(Li et al., 2022)
080501-RZ1	SQT	32.09	84.08	Granodiorite (170.7 Ma)	AHe	56.1	0.1		(Li et al., 2022)
080502-RZ1	SQT	32.07	84.03	Granite (160.1 Ma)	AHe	22.6	2.6		(Li et al., 2022)
080502-RZ3	SQT	32.07	84.07	Granite (165.5 Ma)	AHe	37.9	1.9		(Li et al., 2022)
081302-RZ1	SQT	32.00	86.37	Sandstone (< 162 Ma)	AHe	47.3	3.9		(Li et al., 2022)
081304-RZ1	SQT	32.11	86.40	Sandstone (< 162 Ma)	AHe	58	5		(Li et al., 2022)
081306-RZ1	SQT	32.06	86.37	Sandstone (< 162 Ma)	AHe	41	13.9		(Li et al., 2022)
081801-RZ1	SQT	32.06	84.01	Micaschist (< 994 Ma)	AHe	63	4.4		(Li et al., 2022)
080311-RZ1	SQT	32.31	84.68	Granodiorite (118.9 Ma	ZHe	76.6	1.7		(Li et al., 2022)
080402-RZ1	SQT	32.33	84.79	Granodiorite	ZHe	54.4	3.7		(Li et al., 2022)
080502-RZ1	SQT	32.07	84.03	Granite (160.1 Ma)	ZHe	67.8	0.7		(Li et al., 2022)
080502-RZ3	SQT	32.07	84.07	Granite (165.5 Ma)	ZHe	76.6	13.3		(Li et al., 2022)

081302-RZ1	SQT	32.00	86.37	Sandstone (< 162 Ma)	ZHe	71.9	8.3		(Li et al., 2022)
081304-RZ1	SQT	32.11	86.40	Sandstone (< 162 Ma)	ZHe	113	8.4		(Li et al., 2022)
081306-RZ1	SQT	32.06	86.37	Sandstone (< 162 Ma)	ZHe	109.3	10.5		(Li et al., 2022)
081801-RZ1	SQT	32.06	84.01	Micaschist (< 994 Ma)	ZHe	73.8	3.5		(Li et al., 2022)
RS17-N1-C4*	SQT	32.10	87.42	Conglomerate (~120 Ma)	AFT	71	6.3	0	(Xue et al., 2022)
RS17-N1-C5*	SQT	32.10	87.42	Conglomerate (~120 Ma)	AFT	77	10	3	(Xue et al., 2022)
RS17-N1-C6	SQT	32.10	87.42	Conglomerate (~120 Ma)	AFT	33.6	3	69	(Xue et al., 2022)
RS19-06-C3	SQT	32.10	87.42	Conglomerate (~120 Ma)	AFT	33.1	3.7	23	(Xue et al., 2022)
RS19-06-C6	SQT	32.10	87.42	Conglomerate (~120 Ma)	AFT	33.6	2.7	10	(Xue et al., 2022)
RS19-06-C4	SQT	32.10	87.42	Conglomerate (~120 Ma)	AFT	31.3	2.4	10	(Xue et al., 2022)
RS17-N1-C1	SQT	32.10	87.42	Conglomerate (~120 Ma)	AFT	51.7	10.8	4	(Xue et al., 2022)
RS17-N1-C2	SQT	32.10	87.42	Conglomerate (~120 Ma)	AFT	49.3	10.3	89	(Xue et al., 2022)
RS17-N1-C3*	SQT	32.10	87.42	Conglomerate (~120 Ma)	AFT	81	16.9	0	(Xue et al., 2022)
RS17-N4-C1	SQT	32.11	87.42	Conglomerate (~120 Ma)	AFT	51.3	3.9	9	(Xue et al., 2022)
RS19-10-C1	SQT	32.11	87.42	Conglomerate (~120 Ma)	AFT	67	5.3	43	(Xue et al., 2022)
RS17-N5*	SQT	32.22	87.22	Granite (~120 Ma)	AFT	96.8	7.3	0	(Xue et al., 2022)
RS19-05B*	SQT	32.26	87.30	Granite (~120 Ma)	AFT	57.1	3.3	2	(Xue et al., 2022)
RS19-08	SQT	32.26	87.27	Granite (~120 Ma)	AFT	49	3.3	60	(Xue et al., 2022)
RS19-07	SQT	32.26	87.29	Granite (~120 Ma)	AFT	57.2	4.4	17	(Xue et al., 2022)
RS19-05A	SQT	32.24	87.30	Granite (~120 Ma)	AFT	42.5	2.9	50	(Xue et al., 2022)
RS17-N1-C5	SQT	32.10	87.42	Conglomerate (~120 Ma)	AHe	44.3	8.8		(Xue et al., 2022)
RS19-06-C3	SQT	32.10	87.42	Conglomerate (~120 Ma)	AHe	48.1	8.5		(Xue et al., 2022)
RS19-06-C6	SQT	32.10	87.42	Conglomerate (~120 Ma)	AHe	37.3	6.8		(Xue et al., 2022)
RS17-N1-C3	SQT	32.10	87.42	Conglomerate (~120 Ma)	AHe	64.2	6.2		(Xue et al., 2022)
RS17-N4-C1	SQT	32.11	87.42	Conglomerate (~120 Ma)	AHe	51.6	3.5		(Xue et al., 2022)
RS19-10-C1	SQT	32.11	87.42	Conglomerate (~120 Ma)	AHe	45.6	8.4		(Xue et al., 2022)
RS17-N5	SQT	32.22	87.22	Granite (~120 Ma)	AHe	67.1	12		(Xue et al., 2022)
RS17-N1-C5	SQT	32.10	87.42	Conglomerate (~120 Ma)	ZHe	117	14		(Xue et al., 2022)
RS17-N1-C6*	SQT	32.10	87.42	Conglomerate (~120 Ma)	ZHe	136	24		(Xue et al., 2022)
RS17-N4-C1	SQT	32.11	87.42	Conglomerate (~120 Ma)	ZHe	90	11		(Xue et al., 2022)

DL2014-88	SQT	32.87	83.50	Andesite (K1)	AHe	82.9	5.4		(Xue et al., 2022)
B–1	CQT	32.48	91.85	Sandstone (K_2)	AFT	48.6	4.3	49.2	(Bi et al., 2020)
B–2	CQT	32.54	91.84	Sandstone (T_3)	AFT	35.7	4.2	22	(Bi et al., 2020)
Ep1502	CQT	32.91	90.82	Sandstone (J_2)	AHe	38.1	2		(Bi et al., 2020)
Ep1503	CQT	32.88	90.84	Sandstone (J_2)	AHe	41	2.2		(Bi et al., 2020)
D0103	CQT	33.33	88.43	Granite (T_3)	AHe	63.8	4.5		(Qian et al., 2021)
D0108	CQT	33.36	88.50	Granite (T_3)	AHe	59.4	4.2		(Qian et al., 2021)
D1102	CQT	33.22	88.28	Granite (T_3)	AHe	77.9	17.5		(Qian et al., 2021)
Q1	CQT	33.31	87.77	Granite (T_3)	AHe	73.6	5		(Qian et al., 2021)
D0103	CQT	33.33	88.43	Granite (T_3)	ZHe	141.4	14.6		(Qian et al., 2021)
D0108	CQT	33.36	88.50	Granite (T_3)	ZHe	166.7	18.6		(Qian et al., 2021)
D1102	CQT	33.22	88.28	Granite (T_3)	ZHe	147.1	18.5		(Qian et al., 2021)
Q1	CQT	33.31	87.77	Granite (T_3)	ZHe	147.8	8.7		(Qian et al., 2021)
GP13–(2)CH1	CQT	33.47	85.28	Sandstone (P_2)	AFT	69.8	4.2	>5	(Ren et al., 2015)
GP13–(5)CH1*	CQT	33.47	85.28	Sandstone (P_2)	AFT	124.9	12.3	<0.1	(Ren et al., 2015)
JBP20CH2*	CQT	33.28	88.43	Sandstone (J_3)	AFT	117	9.9	<0.1	(Ren et al., 2015)
JP04–(25)cH9	CQT	33.75	85.58	Sandstone (J_1)	AFT	108.7	2.5	>70	(Ren et al., 2015)
JP04—(41)S1*	CQT	33.75	85.58	Sandstone (J_1)	AFT	132.1	17.8	<0.1	(Ren et al., 2015)
RPI11–CH30	CQT	33.20	86.88	Sandstone (T_1)	AFT	87.3	3	>30	(Ren et al., 2015)
AR1	CQT	33.25	85.19	Granite (153 Ma)	AHe	19.1	0.3		(Rohrmann et al., 2012)
AR2	CQT	33.20	86.74	Granite	AHe	16.2	4.1		(Rohrmann et al., 2012)
AR3	CQT	32.76	84.56	Granite (139 Ma)	AHe	44.5	2.2		(Rohrmann et al., 2012)
AR4	CQT	33.87	84.12	Granite	AHe	37	0.7		(Rohrmann et al., 2012)
AR5	CQT	32.78	84.02	Granite	AHe	48.8	0.7		(Rohrmann et al., 2012)
AR6	CQT	32.71	84.24	Granite	AHe	51.6	2		(Rohrmann et al., 2012)
GT1	CQT	33.25	85.19	Granite (200 Ma)	AHe	45.2	1		(Rohrmann et al., 2012)
PK6	CQT	33.30	85.17	Granite (474 Ma)	AHe	27.6	0.4		(Rohrmann et al., 2012)
Q6	CQT	33.72	87.73	Sandstone (J_2)	AFT	31	0.4	38.6	(Song et al., 2013)

Q7	CQT	33.43	87.52	Sandstone (T_3)	AFT	60	0.5	79.6	(Song et al., 2013)
Q8	CQT	33.02	87.68	Sandstone (T_3)	AFT	26	0.3	63.8	(Song et al., 2013)
Q9	CQT	33.02	87.87	Sandstone (T_3)	AFT	42	0.5	90.5	(Song et al., 2013)
C1	CQT	33.26	88.68	Basalt (P)	AFT	116	8	8.7	(Song et al., 2018)
C10	CQT	33.24	88.36	Schist (AnO)	AFT	67	5	14.9	(Song et al., 2018)
C11	CQT	33.23	88.34	Basalt (P)	AFT	87	8	44.3	(Song et al., 2018)
C12	CQT	33.19	88.22	Schist (AnO)	AFT	83	7	62.2	(Song et al., 2018)
C13	CQT	33.20	88.16	Basalt (P)	AFT	72	6	100	(Song et al., 2018)
C14*	CQT	33.29	88.77	Granodiorite (T_3)	AFT	80	7	0	(Song et al., 2018)
C15	CQT	33.39	87.38	Basalt (P)	AFT	87	7	31.7	(Song et al., 2018)
C2*	CQT	33.26	88.66	Schist (AnO)	AFT	118	7	0	(Song et al., 2018)
C3	CQT	33.29	88.60	Schist (AnO)	AFT	66	10	98.1	(Song et al., 2018)
C4	CQT	33.31	88.56	Schist (AnO)	AFT	57	5	2.83	(Song et al., 2018)
C5*	CQT	33.33	88.56	Granodiorite (T_3)	AFT	66	6	0	(Song et al., 2018)
C6	CQT	33.56	88.50	Granodiorite (T_3)	AFT	86	6	6.8	(Song et al., 2018)
C7*	CQT	33.29	88.42	Granodiorite (T_3)	AFT	84	6	0.2	(Song et al., 2018)
C8	CQT	33.32	88.41	Granodiorite (T_3)	AFT	92	6	0	(Song et al., 2018)
C9*	CQT	33.28	88.37	Granodiorite (T_3)	AFT	78	6	0.1	(Song et al., 2018)
Ed0616*	CQT	32.94	91.71	Sandstone (J_2)	AFT	94	6.8	1	(Zhang et al., 2019)
Ed0620	CQT	33.00	90.73	Sandstone (T_3)	AFT	54.7	4.2	24.2	(Zhang et al., 2019)
Ep1502*	CQT	32.91	90.82	Sandstone (J_2)	AFT	55.4	4.2	1	(Zhang et al., 2019)
Ep1503	CQT	32.88	90.84	Sandstone (J_2)	AFT	43.8	3.4	14.3	(Zhang et al., 2019)
Ep1505	CQT	32.97	90.74	Sandstone (T_3)	AFT	53.5	4	39.7	(Zhang et al., 2019)
Ep1506	CQT	32.73	91.07	Sandstone (T_3)	AFT	84.1	6.7	92.8	(Zhang et al., 2019)
PQ1506	CQT	32.77	88.90	Sandstone (J_2)	AFT	120.9	5.5	100	(Zhang et al., 2019)
0729–RZ7	CQT	33.94	86.91	Sandstone (K_2)	ZHe	156.5	41.6		(Zhao et al., 2017)
0819–RZ1	CQT	33.21	86.62	Granite (T_3)	ZHe	149.7	5.6		(Zhao et al., 2017)
0819–RZ2*	CQT	33.22	86.62	Granite (T_3)	ZHe	176.8	14.6		(Zhao et al., 2017)

0819–RZ3	CQT	33.23	86.62	Granite (T_3)	ZHe	132.7	5.1		(Zhao et al., 2017)
0819–RZ4	CQT	33.19	86.64	Granite (T_3)	ZHe	141	9.3		(Zhao et al., 2017)
0819–RZ5*	CQT	33.11	86.68	Mélange rock (T_3)	ZHe	192.3	6.7		(Zhao et al., 2017)
0819–RZ7*	CQT	33.05	86.69	Mélange rock (T_3)	ZHe	198.9	16.8		(Zhao et al., 2017)
0825–RZ1	CQT	33.46	86.60	Quartzite (Pre-O)	ZHe	148	2.2		(Zhao et al., 2017)
1407–1*	CQT	33.19	86.62	Granite (T_3)	AFT	57	3	0	(Zhao et al., 2019)
1411–1*	CQT	33.23	86.39	Granite (T_3)	AFT	94	5	0	(Zhao et al., 2019)
1412–1	CQT	33.13	86.36	Granite (T_3)	AFT	60	3	21.5	(Zhao et al., 2019)
1413–1*	CQT	33.09	86.36	Granite (T_3)	AFT	81	4	0	(Zhao et al., 2019)
1430–1*	CQT	33.02	86.41	Granite (T_3)	AFT	70	4	0	(Zhao et al., 2019)
1431–1*	CQT	33.04	86.47	Granite (T_3)	AFT	65	3	0	(Zhao et al., 2019)
1437–2	CQT	33.37	87.64	Granite (T_3)	AFT	82	5	8.7	(Zhao et al., 2019)
1455–1*	CQT	33.35	87.75	Granite (T_3)	AFT	60	3	0	(Zhao et al., 2019)
1456–1	CQT	33.34	87.81	Granite (T_3)	AFT	67	5	54.7	(Zhao et al., 2019)
1457–1	CQT	33.17	87.87	Granite (T_3)	AFT	74	4	5.7	(Zhao et al., 2019)
1458–2*	CQT	33.23	87.99	Granite (T_3)	AFT	83	5	0.6	(Zhao et al., 2019)
1461–1*	CQT	33.26	88.16	Granite (T_3)	AFT	70	4	0.2	(Zhao et al., 2019)
1462–1*	CQT	33.29	88.17	Granite (T_3)	AFT	71	4	0	(Zhao et al., 2019)
1463–1*	CQT	33.33	88.18	Granite (T_3)	AFT	70	4	0	(Zhao et al., 2019)
1465–1	CQT	33.30	88.49	Granite (T_3)	AFT	86	5	59.8	(Zhao et al., 2019)
1466–1	CQT	33.31	88.44	Granite (T_3)	AFT	82	4	5.6	(Zhao et al., 2019)
1468–1*	CQT	33.29	88.39	Granite (T_3)	AFT	72	4	0	(Zhao et al., 2019)
1411-1*	CQT	33.23	86.39	Granite (T_3)	ZFT	166	12	0	(Zhao et al., 2019)
1412–1	CQT	33.13	86.36	Granite (T_3)	ZFT	103	7	45.5	(Zhao et al., 2019)
1413–1	CQT	33.09	86.36	Granite (T_3)	ZFT	119	10	84.5	(Zhao et al., 2019)
1437–2	CQT	33.37	87.64	Granite (T_3)	ZFT	113	5	65.7	(Zhao et al., 2019)
1455–1*	CQT	33.35	87.75	Granite (T_3)	ZFT	121	5	0.3	(Zhao et al., 2019)

1456-1*	CQT	33.34	87.81	Granite (T_3)	ZFT	138	7	0	(Zhao et al., 2019)
1457–1	CQT	33.17	87.87	Granite (T_3)	ZFT	120	5	70.7	(Zhao et al., 2019)
1458–2*	CQT	33.23	87.99	Granite (T_3)	ZFT	131	7	3.4	(Zhao et al., 2019)
1461–1	CQT	33.26	88.16	Granite (T_3)	ZFT	113	7	46.5	(Zhao et al., 2019)
1462–1	CQT	33.29	88.17	Granite (T_3)	ZFT	113	6	24.1	(Zhao et al., 2019)
1463–1	CQT	33.33	88.18	Granite (T_3)	ZFT	117	6	55.7	(Zhao et al., 2019)
1465–1	CQT	33.30	88.49	Granite (T_3)	ZFT	129	8	9.2	(Zhao et al., 2019)
1466–1	CQT	33.31	88.44	Granite (T_3)	ZFT	132	7	30	(Zhao et al., 2019)
1468–1	CQT	33.29	88.39	Granite (T_3)	ZFT	132	7	45.5	(Zhao et al., 2019)
080202–RZ1	CQT	32.63	86.53	Sandstone (T_3)	ZHe	124	33		(Zhao et al., 2020)
080107–RZ1	CQT	32.47	86.58	Sandstone (J_2)	ZHe	141	9		(Zhao et al., 2020)
BP07–9CH7*	SNQT	34.23	86.88	Sandstone (J_2)	AFT	121.1	40.5	<0.1	(Ren et al., 2015)
P0301R1	SNQT	33.38	87.87	Sandstone (J_2)	AFT	26.1	11.5		(Ren et al., 2015)
P04015R1	SNQT	33.38	87.87	Sandstone (J_2)	AFT	30.8	1.4	>30	(Ren et al., 2015)
P04051R1*	SNQT	33.38	87.87	Sandstone (J_2)	AFT	56	5.4	<2	(Ren et al., 2015)
PQ1503*	SNQT	33.36	88.70	Sandstone (J_2)	AFT	40.1	2.6	0	(Zhang et al., 2019)
FT021	CNQT	33.47	89.37	Sandstone (J_3)	AFT	110.9	8.6	63.2	(Wang and Wei, 2013)
FT024	CNQT	33.47	89.37	Sandstone (J_3)	AFT	117.3	8.5	13.1	(Wang and Wei, 2013)
FT233	CNQT	33.47	89.37	Sandstone (J_3)	AFT	83.8	9.9	85.2	(Wang and Wei, 2013)
FT235	CNQT	33.47	89.37	Sandstone (J_3)	AFT	89.5	8.6	38.3	(Wang and Wei, 2013)
ZB–113*	CNQT	34.43	88.53	Sandstone (J_3)	AFT	84.8	7.3	<5	(Ren et al., 2015)
ZB–126*	CNQT	34.43	88.53	Sandstone (J_3)	AFT	88.4	7	<2	(Ren et al., 2015)
ZB–127*	CNQT	34.43	88.53	Sandstone (J_3)	AFT	59.9	4.4	<1	(Ren et al., 2015)
D035	CNQT	34.04	89.53	Sandstone (J_3)	AFT	65.1	5.4	96.6	(This study)
D039	CNQT	34.01	89.54	Sandstone (J_3)	AFT	66	6.4	34.1	(This study)
D074	CNQT	34.05	89.23	Granitoid (E_2)	AFT	39.5	3	7.1	(This study)
D206	CNQT	33.90	89.38	Sandstone (J_3)	AFT	86.5	7.2	26.7	(This study)

P05-2Ft*	CNQT	33.51	89.22	Sandstone (E_{1-2})	AFT	151.7	11.8	1.2	(This study)
P05-4Ft	CNQT	33.50	89.23	Sandstone (E_{1-2})	AFT	128.4	11.9	85.2	(This study)
FT23-1	CNQT	33.64	89.22	Sandstone (J_3K_1)	AFT	64.8	7.4	38.4	(This study)
FT23-3	CNQT	33.63	89.22	Sandstone (J_3K_1)	AFT	83.8	10	6.1	(This study)
FT23-5	CNQT	33.51	89.22	Sandstone (J_3K_1)	AFT	89.6	7.9	94.5	(This study)
FT23-1*	CNQT	33.64	89.22	Sandstone (J_3K_1)	ZFT	251.6	22.4	0	(This study)
FT23-3*	CNQT	33.63	89.22	Sandstone (J_3K_1)	ZFT	201.2	32.8	0.6	(This study)
FT23-5*	CNQT	33.51	89.22	Sandstone (J_3K_1)	ZFT	174.1	15.2	0	(This study)
P05-4Ft*	CNQT	33.50	89.23	Sandstone (E_{1-2})	ZFT	234.1	31.9	0	(This study)
GL-19	CNQT	34.46	88.03	Sandstone (J_2)	AFT	105	7	27	(Zhang et al., 2021)
GL-20	CNQT	33.77	88.43	Sandstone (J_2)	AFT	88.3	6.6	53	(Zhang et al., 2021)
GL-21	CNQT	34.10	88.49	Sandstone (J_2)	AFT	96.1	7.5	54	(Zhang et al., 2021)
GL-23*	CNQT	34.48	88.50	Sandstone (J_2)	AFT	78.6	6.6	1	(Zhang et al., 2021)
GL-24	CNQT	33.82	88.33	Sandstone (J_2)	AFT	113	8	38	(Zhang et al., 2021)
H-16	CNQT	34.69	89.57	Sandstone (J_3K_1)	AFT	62.1	4.4	5	(Zhang et al., 2021)
H-17	CNQT	34.86	89.66	Sandstone (J_3K_1)	AFT	74.3	6	35	(Zhang et al., 2021)
H-2*	CNQT	34.22	89.61	Sandstone (J_3K_1)	AFT	131	8	0	(Zhang et al., 2021)
H-3	CNQT	34.30	89.64	Sandstone (J_3)	AFT	75.3	6	99	(Zhang et al., 2021)
H-4	CNQT	34.57	89.60	Sandstone (J_3)	AFT	62.3	5.3	59	(Zhang et al., 2021)
WJP64B18	NNQT	34.87	89.40	Sandstone (J_3)	AFT	43.5	2.1	>95	(Ren et al., 2015)
XP7–Ch4	NNQT	34.38	86.47	Sandstone (J_2)	AFT	40.7	1.9	>5	(Ren et al., 2015)
Q1	NNQT	34.93	87.83	Sandstone (T_3)	AFT	52	0.4	6.5	(Song et al., 2013)
Q2*	NNQT	34.92	87.80	Sandstone (J_2)	AFT	43	0.7	0.8	(Song et al., 2013)
Q3*	NNQT	34.80	87.53	Sandstone (T_3)	AFT	42	0.6	0	(Song et al., 2013)
Q4	NNQT	34.78	87.55	Tuff (T_3)	AFT	39	0.4	27.5	(Song et al., 2013)
Q13*	NNQT	33.78	91.13	Sandstone (T_3)	ZFT	54	8	0	(Song et al., 2013)
H-18*	NNQT	35.05	89.70	Sandstone (D_2)	AFT	101	12	0	(Zhang et al., 2021)

ZP12B7	NNQT	33.30	90.97	Sandstone (J_2)	AFT	23.2	6.8	>70	(Ren et al., 2015)
CH--162	NNQT	33.02	92.75	Sandstone (J_2)	AFT	10.3	1.2	>50	(Ren et al., 2015)
CH--169*	NNQT	33.02	92.75	Sandstone (J_2)	AFT	54.5	10.4	<2	(Ren et al., 2015)
CH--242*	NNQT	33.02	92.75	Sandstone (J_2)	AFT	49.3	4.3	<1	(Ren et al., 2015)
CH--272*	NNQT	33.02	92.75	Sandstone (J_2)	AFT	99	22.3	<0.1	(Ren et al., 2015)
PE149-Z52*	NNQT	33.75	91.42	Sandstone (J_3)	AFT	56.5	3.7	<1	(Ren et al., 2015)
PE33-R	NNQT	33.75	91.42	Sandstone (J_2)	AFT	44.4	1.6	>30	(Ren et al., 2015)
PE65-Z35	NNQT	33.75	91.42	Sandstone (J_2)	AFT	36.7	2.4	>80	(Ren et al., 2015)
PE98-Z43	NNQT	33.75	91.42	Sandstone (J_2)	AFT	26	1.7	>5	(Ren et al., 2015)
PU1	NNQT	33.25	92.01	Granitoid (69.2 Ma)	AFT	53.6	2.1	88.5	(Rohrmann et al., 2012)
PU1	NNQT	33.25	92.01	Granitoid (69.2 Ma)	AHe	43	0.5		(Rohrmann et al., 2012)
Q10	NNQT	33.68	91.85	Sandstone (T_3)	AFT	54	8	83	(Song et al., 2013)
Q11	NNQT	33.73	91.75	Sandstone (T_3)	AFT	39	5	33.8	(Song et al., 2013)
Q12	NNQT	33.72	91.32	Rhyolite (T_3)	AFT	56	11	4.8	(Song et al., 2013)
Q13*	NNQT	33.78	91.13	Sandstone (T_3)	AFT	32	8	0	(Song et al., 2013)
Q14	NNQT	33.80	91.25	Sandstone (J_2)	AFT	41	5	26.5	(Song et al., 2013)
P01(96)B1*	NNQT	33.60	92.07	Sandstone (J_3)	AFT	82	18.7	<5	(Wang et al., 2008)
P0126HX	NNQT	33.61	92.07	Sandstone (J_2)	AFT	38.2	4		(Wang et al., 2008)
P0158HX	NNQT	33.60	92.07	Sandstone (J_2)	AFT	47.3	4.3		(Wang et al., 2008)
P0171HX	NNQT	33.58	92.07	Sandstone (J_2)	AFT	39.4	5.5		(Wang et al., 2008)
P171FT1	NNQT	33.45	92.35	Granitoid (69.8 Ma)	AFT	55.5	7.5	68.2	(Wang et al., 2008)
P172FT2	NNQT	33.45	92.35	Granitoid (69.8 Ma)	AFT	55.8	5.4	62.1	(Wang et al., 2008)
P172FT5*	NNQT	33.45	92.35	Granitoid (69.8 Ma)	AFT	66.9	10.9	3.5	(Wang et al., 2008)
TGL-Ft-1	NNQT	33.01	91.97	Sandstone (J_2)	AFT	47.3	4	55.6	(Wang et al., 2008)
WLFt-y0	NNQT	34.60	90.17	Sandstone (E_{2-3})	AFT	44.2	4.7	11.5	(Wang et al., 2008)
WLFt-y2	NNQT	34.60	90.18	Sandstone (E_{2-3})	AFT	56.5	11.3	97	(Wang et al., 2008)
WLFt-y3	NNQT	34.60	90.17	Sandstone (E_{2-3})	AFT	52.6	4.5	61.7	(Wang et al., 2008)

YSP-Ft-1	NNQT	33.60	92.08	Sandstone (J_2)	AFT	37.7	3	77.8	(Wang et al., 2008)

Note: To screen the reset data, these data ages must be younger than their corresponding stratigraphic ages or crystallization age of pluton. In addition, the ZFT and AFT ages should pass χ2 tests (P[χ2] < 5%) (Galbraith and Green 1990), and there are the relatively consistent single grain ages for ZHe and AHe data；

*the partially reset or no reset ages；

P(χ2) = the probability of obtaining χ2 value for n degrees of freedom (where n is the number of crystals -1) (Galbraith, 1981). P(χ2)⩾5%.

TABLE S2. SAMPLE DETAILS

Sample No.	Lat. (°)	Long. (°)	Elev. (m)	Stratigraphy/ plutons (Age–constraints)	Lithology
FT23-1	33.64	89.22	5340	Xueshan Formation (J_3K_1x) (144-<138 Ma)	Sandstone
FT23-3	33.63	89.22	5280	Xueshan Formation (J_3K_1x) (144-<138 Ma)	Sandstone
FT23-5	33.51	89.22	5220	Xueshan Formation (J_3K_1x) (144-<138 Ma)	Sandstone
P05-2Ft	33.51	89.22	5070	Kangtuo Formation ($E_{1-2}k$)	Sandstone
P05-4Ft	33.50	89.23	5110	Kangtuo Formation ($E_{1-2}k$)	Sandstone
D039	34.01	89.54	5267	Bailongbinghe Formation (J_3b)(157-144Ma)	Sandstone
D206	33.90	89.38	5348	Bailongbinghe Formation (J_3b)(157-144Ma)	Sandstone
D074	34.05	89.23	5242	Granitoids (~40 Ma)	Granite
D035	34.04	89.53	5312	Bailongbinghe Formation (J_3b)(157-144Ma)	Sandstone

Note: Age–constraints on Jurassic strata are from Fang et al. (2016). Age of pluton is from Zhu and Yu., 2012.