

Supplementary Information

Samples ages and zircons Hf isotopes were compiled from the same sources as following lists. In west Australia, zircons from Neoproterozoic to early Paleozoic strata are characterized by two main peaks at 1200-1100 and 700-500 Ma ([Fig. S3b](#)). In marked contrast, the 950-750 Ma grains characterizing south Tarim are absent from west Australia.

Fig. S1 Geological map of the south Tarim showing Western Kunlun (north Western Kunlun terrane, south Western Kunlun terrane, Taishuihai terrane, and Karakorum terrane), Altyn Tagh area, and western segment of Eastern Kunlun (modified from 1:250000 geological maps). Note that ages of most strata are not well constrained. Insert shows the Tarim Craton and other adjacent cratons. E.S-Early Silurian; Pt₃-Neoproterozoic; Pt₂-Mesoproterozoic. Data source see Table S3.

Fig. S2 Tectonic divisions of the Altyn Tagh orogen

Fig. S3 Detrital zircon ages of Proterozoic to Early Paleozoic strata in different terranes in Eastern Gondwana. (a) south Tarim; (b) west Australia; (c) north India. Compiled samples and data sources are listed in Table S4.

Table S1 Compiled igneous rocks in North Tarim

Table S2 Compiled igneous rocks in South Tarim

Table S3 Compiled samples for Neoproterozoic-Silurian strata in South Tarim

Table S4 Compiled samples for Neoproterozoic-Ordovician strata in North India.

Table S1 Complied igneous rocks in North Tarim

Petrology	Sample No.	Methods	Minerals	Ages/Ma	Errors	Resources
Monzogranite	M2	LA-CIP-MS	zircon	816	5	Cao et al., 2011
Granitic dike	XJ587	LA-CIP-MS	zircon	798	6	Deng et al., 2008
Mafic dike		Ar-Ar	Amphibole	745	3	Lu et al., 2018
Layered basite		Ar-Ar	Pyroxene	521	2	Lu et al., 2018
Granitic rocks	Q30	LA-CIP-MS	zircon	847	6	Wu et al., 2018
Granitic rocks	Q13	LA-CIP-MS	zircon	852	7	Wu et al., 2018
Mafic dike	AKS03	TIMS	zircon	759	7	Zhang et al., 2009
Basalts		LA-CIP-MS	zircon	784	2	Zhang et al., 2012
Andesite	XT1-4859	SHRIMP	zircon	755	3	Xu et al., 2013
gneiss	XS53-5688	LA-CIP-MS	zircon	1848	7	Xu et al., 2013
Granitic gneiss	XXH1-6135	LA-CIP-MS	zircon	832	4	Xu et al., 2013
Monzogranite		LA-CIP-MS	Zircon	816	4.6	Cao et al., 2011
Gabbro	XJ593	LA-CIP-MS	Zircon	2502	31	Deng et al., 2008
Granite	XJ587	LA-CIP-MS	Zircon	798	6	Deng et al., 2008
Diabase	XJ589	LA-CIP-MS	Zircon	813	41	Deng et al., 2008
Xinger Granite		LA-CIP-MS	Zircon	1915	13	Long et al., 2012
Orthogneisses	502-12	LA-CIP-MS	Zircon	2516	6	Long et al., 2010
Orthogneisses	502-12	LA-CIP-MS	Zircon	2223	6	Long et al., 2010
Orthogneisses	607-11	LA-CIP-MS	Zircon	1789	21	Long et al., 2010
Orthogneisses	581-1	LA-CIP-MS	Zircon	2460	3	Long et al., 2010
Granodiorite	T556	LA-CIP-MS	Zircon	798	3	Long et al., 2011
Granodiorite	T558	LA-CIP-MS	Zircon	754	4	Long et al., 2011
Granodiorite	T579	LA-CIP-MS	Zircon	790	3	Long et al., 2011
Granodiorite	T559	LA-CIP-MS	Zircon	785	8	Long et al., 2011
TTG		SIMS	Zircon	2652	11	Long et al., 2011
Meta-diabase		LA-CIP-MS	Zircon	1470	9	Wu et al., 2014
Diabase Sill	16XJ-21	LA-CIP-MS	Zircon	1551	8	Zhang et al., 2018
Orthogneiss	12K82	SHRIMP	Zircon	2714	10	Ge et al., 2014
Orthogneiss	12K83	LA-CIP-MS	Zircon	2706	21	Ge et al., 2014
Orthogneiss	12K100	LA-CIP-MS	Zircon	2742	29	Ge et al., 2014
Granodiorite	11K07	LA-CIP-MS	Zircon	830	5	Ge et al., 2014
Granodiorite	11K97	LA-CIP-MS	Zircon	821	6	Ge et al., 2014
Granite	11K105	LA-CIP-MS	Zircon	828	7	Ge et al., 2014
Two-mica granite	11K109	LA-CIP-MS	Zircon	831	6	Ge et al., 2014
Quartz syenite	11K48	LA-CIP-MS	Zircon	660	5	Ge et al., 2014
Quartz syenite	11K51	LA-CIP-MS	Zircon	659	6	Ge et al., 2014
Quartz syenite	11K46	LA-CIP-MS	Zircon	627	4	Ge et al., 2014

Syenogranite	11K55	LA-CIP-MS	Zircon	636	5	Ge et al., 2014
Syenogranite	11K64	LA-CIP-MS	Zircon	656	6	Ge et al., 2014
Syenogranite	11K84	LA-CIP-MS	Zircon	653	14	Ge et al., 2014
Granodiorite	11K59	LA-CIP-MS	Zircon	418	4	Ge et al., 2014
Granodiorite	11K71	LA-CIP-MS	Zircon	421	4	Ge et al., 2014
Granodiorite	11K75	LA-CIP-MS	Zircon	420	4	Ge et al., 2014
Granodiorite	11K78	LA-CIP-MS	Zircon	420	4	Ge et al., 2014
Granodiorite	11K81	LA-CIP-MS	Zircon	418	4	Ge et al., 2014
Monzogranite	11K63	LA-CIP-MS	Zircon	420	4	Ge et al., 2014
Monzogranite	11K68	LA-CIP-MS	Zircon	417	4	Ge et al., 2014
Monzogranite	11K83	LA-CIP-MS	Zircon	420	4	Ge et al., 2014
Monzogranite	11K01	LA-CIP-MS	Zircon	408	4	Ge et al., 2014
Monzogranite	12K16	LA-CIP-MS	Zircon	406	4	Ge et al., 2014
Diorite	11K09	LA-CIP-MS	Zircon	417	5	Ge et al., 2014
Diorite	11K33	LA-CIP-MS	Zircon	422	4	Ge et al., 2014
Migmatite	10K01	LA-CIP-MS	Zircon	1828	22	Ge et al., 2013
Migmatite	10K02	LA-CIP-MS	Zircon	1840	42	Ge et al., 2013
Melanosome	10T72	LA-CIP-MS	Zircon	2292	18	Ge et al., 2013
Leucocratic vein	10T71	LA-CIP-MS	Zircon	824	8	Ge et al., 2013
Leucogranite	10T01	LA-CIP-MS	Zircon	829	9	Ge et al., 2013
Leucogranite	10T06	LA-CIP-MS	Zircon	828	6	Ge et al., 2013
Melanosome	10T51	LA-CIP-MS	Zircon	1833	29	Ge et al., 2013
Leucosome	10T50	LA-CIP-MS	Zircon	823	8	Ge et al., 2013
Quartz syenite	T4	LA-CIP-MS	Zircon	662	4	Ge et al., 2012
Quartz syenite	10T66	LA-CIP-MS	Zircon	663	7	Ge et al., 2012
Quartz syenite	10T10	LA-CIP-MS	Zircon	661	6	Ge et al., 2012
Syneogranite	10T03	LA-CIP-MS	Zircon	627	5	Ge et al., 2012
Syneogranite	10T08	LA-CIP-MS	Zircon	629	5	Ge et al., 2012
Leucogramotoc vein	10T52	LA-CIP-MS	Zircon	635	3	Ge et al., 2012
Migmatite	10T53	LA-CIP-MS	Zircon	659	3	Ge et al., 2012
Granodiorite	09T11	LA-CIP-MS	Zircon	421	3	Ge et al., 2012
Granodiorite	09T19	LA-CIP-MS	Zircon	422	3	Ge et al., 2012
Granodiorite	09T25	LA-CIP-MS	Zircon	419	3	Ge et al., 2012
Meta-diabase	487	LA-CIP-MS	Zircon	775	12	Su et al., 2011
Geneissic granite	571-1	LA-CIP-MS	Zircon	2469	12	Su et al., 2011
Meta-diorite	576	LA-CIP-MS	Zircon	2470	24	Su et al., 2011
Granite	586	LA-CIP-MS	Zircon	586	8	Su et al., 2011
Granite	587	LA-CIP-MS	Zircon	789	7	Su et al., 2011

Foliated granite	601	LA-CIP-MS	Zircon	933	11	Su et al., 2011
Granite	569	LA-CIP-MS	Zircon	1048	19	Su et al., 2011
Gabbronorite	XD-I-B3	LA-CIP-MS	Zircon	728	5	Tang et al., 2016
Gabbronorite	XD-IV-B1	LA-CIP-MS	Zircon	727	4	Tang et al., 2016
Diabase	BW-SC-2	LA-CIP-MS	Zircon	1497	21	Wang et al., 2018
Granite	ZY-ZC-1	LA-CIP-MS	Zircon	1974	27	Wan, et al., 2018
Volcanic rock		SHRIMP	Zircon	755	15	Xu et al., 2005
Mafic dikes	T10	SHRIMP	Zircon	628	7	Zhu et al., 2008
Mafic dikes	T11	SHRIMP	Zircon	652	7	Zhu et al., 2008
Mafic dikes	T13	SHRIMP	Zircon	642	6.8	Zhu et al., 2008
Carbonatite	05QG-09	TIMS	Baddeleyite	810	6	Zhang et al., 2007
Granodiorite	KL010	SHRIMP	Zircon	820	10	Zhang et al., 2007
Granodiorite	KL08	SHRIMP	Zircon	795	9.5	Zhang et al., 2007
Gabbro	KL8	SHRIMP	Zircon	760	6	Zhang et al., 2011
Quartz diorite		LA-CIP-MS	Zircon	1934	13	Lei et al., 2012
Granodiorite		LA-CIP-MS	Zircon	1944	19	Lei et al., 2012
Granite	KLMS-33	LA-CIP-MS	Zircon	407	3	Chen et al., 2015
Granite	HLG5	LA-CIP-MS	Zircon	416	4	Jiang et al, 2015
Gabbro	GLG17-1	LA-CIP-MS	Zircon	334	5	Jiang et al, 2014
Granodiorite	BLT02	LA-CIP-MS	Zircon	473	6	Shi et al., 2014
Foliated Gabbro	BL01	LA-CIP-MS	Zircon	442	7	Shi et al., 2014
Granite	XSS1	LA-CIP-MS	Zircon	458	9	Shi et al., 2014
Amphibolite	XSS4	LA-CIP-MS	Zircon	410	11	Shi et al., 2014
Granite	XSS2	LA-CIP-MS	Zircon	404	13	Shi et al., 2014
Granite	XSS3	LA-CIP-MS	Zircon	405	14	Shi et al., 2014
Granite	XXX01	LA-CIP-MS	Zircon	393	3	Shi et al., 2014
Granite	YSG12	LA-CIP-MS	Zircon	399	2	Shi et al., 2014
Tonalite	W8037	LA-CIP-MS	Zircon	333	2	Guo et al., 2012
Granodiorite	W8028	LA-CIP-MS	Zircon	326	3	Guo et al., 2012
Granite	AR1	LA-CIP-MS	Zircon	320	4	Jin et al., 2014
Granodiorite	761	LA-CIP-MS	Zircon	352	3	Ma et al., 2014
Granite	763	LA-CIP-MS	Zircon	337	3	Ma et al., 2014
Granite	766	LA-CIP-MS	Zircon	399	4	Ma et al., 2014
Granite	782	LA-CIP-MS	Zircon	434	4	Ma et al., 2014
Granodiorite	784	LA-CIP-MS	Zircon	451	3	Ma et al., 2014
Granite	791	LA-CIP-MS	Zircon	366	4	Ma et al., 2014
Granite	794	LA-CIP-MS	Zircon	339	3	Ma et al., 2014
Granite	797-1	LA-CIP-MS	Zircon	346	3	Ma et al., 2014
Granodiorite	798	LA-CIP-MS	Zircon	352	3	Ma et al., 2014
Diorite	798-2	LA-CIP-MS	Zircon	371	4	Ma et al., 2014
Granodiorite	638	LA-CIP-MS	Zircon	475	2	Ma et al., 2013
Hornblende diorite	686	LA-CIP-MS	Zircon	474	2	Ma et al., 2013
Mafic rock	724	LA-CIP-MS	Zircon	427	2	Ma et al., 2013

Mafic rock	724	LA-CIP-MS	Zircon	427	2	Ma et al., 2013
Granite	TS06	LA-CIP-MS	Zircon	404	6	Zhu et al., 2011
Granite	TS277	LA-CIP-MS	Zircon	443	3	Zhu et al., 2011
Granite	W01-9	LA-CIP-MS	Zircon	440	3	Yang et al., 2012
Monzogranite	LKMS-13	LA-CIP-MS	Zircon	446	3	Chen et al., 2015
Granite	KLMS-27	LA-CIP-MS	Zircon	431	3	Chen et al., 2015
Basalts	TS01	LA-CIP-MS	Zircon	352	3	Zhu et al., 2009
Basalts	TS04	LA-CIP-MS	Zircon	324	5	Zhu et al., 2009
Basalts	TS02	LA-CIP-MS	Zircon	313	4	Zhu et al., 2009

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Table S2 Compiled igneous rocks in South Tarim

Location/Name	Petrology	Sample No.	Methods	Minerals	Ages/Ma	Errros	Resources
Heluositan	Orthogneiss	07HL-51	LA-ICP-MS	Zircon	2257	6	Wang et al.,2014
	Orthogneiss	11XZ-8	LA-ICP-MS	Zircon	2306	10	Wang et al.,2014
Duweituwei	Orthogneiss	12TK-9	LA-ICP-MS	Zircon	1899	10	Wang et al.,2014
	Orthogneiss	12TK-13	LA-ICP-MS	Zircon	1795	32	Wang et al.,2014
Heluositan complex	Granitic gneiss	13TR05	LA-ICP-MS	Zircon	2386	56	Ye et al., 2016
Heluositan complex	Granitic gneiss		LA-ICP-MS	Zircon	2284	13	Ye et al., 2016
Heluositan complex	Granitic gneiss	13TR07	LA-ICP-MS	Zircon	2365	36	Ye et al., 2016
Heluositan complex	Granitic gneiss		LA-ICP-MS	Zircon	2299	19	Ye et al., 2016
Heluositan complex	Granitic gneiss	14KL02	LA-ICP-MS	Zircon	2339	13	Ye et al., 2016
Heluositan complex	Granitic gneiss		LA-ICP-MS	Zircon	2346	12	Ye et al., 2016
Akazi (AP)	Granitic geniss			Zircon	2410	20	Zhang et al., 2007 GR
Akazi	Gneiss granite		LA-ICP-MS	Zircon	2335.4	2.8	Yang, WW et al., 2014
Xuxugou (XP)	Granitic geniss			Zircon	2340	8.2	Zhang et al., 2007
Datongxi area	Metaigneous rocks	XXG-04	LA-ICP-MS	Zircon	1848	52	Wu GH et al., 2020
		XXG-05	LA-ICP-MS	Zircon	1816	52	Wu GH et al., 2020
		XXG-06	LA-ICP-MS	Zircon	1926	33	Wu GH et al., 2020
Duweituwei	Granite		LA-ICP-MS	Zircon	1909	47	Liu X et al., 2015
Akazi area	Granitic clast	X7	LA-ICP-MS	Zircon	753.9	3.7	Wu GH et al., 2019
Sailajiazitage Group	Rhyolite	2018KL107	LA-ICP-MS	Zircon	895.8	3.7	Zhang CL et al.,2019
		2018KL109	LA-ICP-MS	Zircon	891.8	3.5	Zhang CL et al.,2019
		2018KL108	LA-ICP-MS	Zircon	899	4.6	Zhang CL et al.,2019
		2018KL114	LA-ICP-MS	Zircon	884.5	4.9	Zhang CL et al.,2019
Sailajiazitage Group	Quartz Keratophyre		LA-ICP-MS	Zircon	841.6	2.1	Yin, DG et al., 2014
Xuxugou (Sukeluoke Group)	Mafic dyke	08KL20	SHRIMP	Zircon	802	9	Zhang et al., 2010
Kudi area	Granitic geniss		SHRIMP	Zircon	815	57	Zhang CL et al., 2003
Yishake Group	Basalt		LA-ICP-MS	Zircon	519.5	1.2	Bai CD et al., 2018
		17WP15			471	2	Wang P et al., 2020 GSAB
Aqiang		17WP23			472	1	Wang P et al., 2020 GSAB
Shangqihan Formation	Volcanic rocks		LA-ICP-MS	Zircon	473.1	2.2	Sang MS et al., 2019
Kashikashi pluton	Granitoid	KSKS-03	LA-ICP-MS	Zircon	466	2	Zhang QC Acta Geologica Sinica 2019
Buya	Granite		SHRIMP	Zircon	430	12	Ye et al., 2008
Buya			Ar-Ar	hornblende	420.6	3.6	Ye et al., 2008
Buya			Ar-Ar	hornblende	419.9	7.5	Ye et al., 2008
Buya	Granite		LA-ICP-MS	Zircon	445	3	Wang P et al 2020
Buya	MME		LA-ICP-MS	Zircon	446	7	Wang P et al 2020
Buya	MME		LA-ICP-MS	Zircon	450	2	Wang P et al 2020
South Yutian	Granodiorite	YM-03	LA-ICP-MS	Zircon	432	2	Zhang QC Lithos 2019
South Yutian	Granodiorite	ALLK-03	LA-ICP-MS	Zircon	450	2	Zhang QC Lithos 2019
South Yutian	Monzonite	KDM-03	LA-ICP-MS	Zircon	428	3	Zhang QC Lithos 2019
Buya	Granite		SHRIMP	Zircon	459	23	Li W et al., 2007

Tiekelike	Granodiorite		LA-ICP-MS	Zircon	444.2	3.5	Hu XY 2018
Buya	Granite		LA-ICP-MS	Zircon	432.4	4.2	Hu XY 2018
	MME		LA-ICP-MS	Zircon	432.4	6.4	Hu XY 2018
Dongbake gneissic tonalite	Tonalite		SHRIMP	Zircon	502.3	9.1	Cui JT et al., 2007
Akazishan	Gneissic pulton		SHRIMP	Zircon	2410	20	Zhang CL et al., 2007
Xuxugou	Gneissic pulton	3009	SHRIMP	Zircon	2343	8.2	Zhang CL et al., 2007
Arkaz	Akazi pluton		SHRIMP	Zircon	2424	46	Zhang CL et al., 2003
Akazishan	Gneissic pulton	2030	SHRIMP	Zircon	1916	7	Zhang CL et al., 2007
Azibailedi	Granite	13TR01	LA-ICP-MS	Zircon	1414	3	Ye et al., 2016
Azibailedi	Granite	13TR02	LA-ICP-MS	Zircon	1408	9	Ye et al., 2016
Azibailedi	Granite		LA-ICP-MS	Zircon	1405	6	Ye et al., 2016
Azibailedi	Granite	13TR03	LA-ICP-MS	Zircon	1412	12	Ye et al., 2016
Azibailedi	Granite		LA-ICP-MS	Zircon	1401	5	Ye et al., 2016
Kudi Complex	Granite	KL2030	SHRIMP	Zircon	783	10	Zhang et al., 2006
			SHRIMP	Zircon	815	57	Zhang CL et al., 2003
Yierba	Monzogranite	X10-16	SHRIMP	Zircon	513	7	Liu et al., 2014
North Kudi	Monzogranite	X10-21	SHRIMP	Zircon	420.6	6.3	Liu et al., 2014
Datong	Granodiorite	DT-1	SHRIMP	Zircon	447.7	5.2	Liao et al., 2010
Datong	Granodiorite	DT-4	SHRIMP	Zircon	469.3	5.3	Liao et al., 2010
Datong	Granodiorite	DT-7-1	SHRIMP	Zircon	453.6	5	Liao et al., 2010
Datong	MME	DT-7-2	SHRIMP	Zircon	448	4.6	Liao et al., 2010
Datong	Granodiorite	DT-15-1	SHRIMP	Zircon	465.3	4.8	Liao et al., 2010
Datong	Granodiorite	DT-18-1	SHRIMP	Zircon	474.4	5.3	Liao et al., 2010
Datong	Monzonite	DT111-1	LA-ICP-MS	Zircon	434.74	0.9	Wang et al., 2017
Datong	Monzonite	DT112-1	LA-ICP-MS	Zircon	443.62	0.92	Wang et al., 2017
Datong	Quartz monzonite	DT112-2	LA-ICP-MS	Zircon	443.6	1.4	Wang et al., 2017
Datong	Granite	DT111-6	LA-ICP-MS	Zircon	426	1	Wang et al., 2017
Bulong	Granite		LA-ICP-MS	Zircon	441	2	Wang et al., 2014
Datong area	Granite		LA-ICP-MS	Zircon	434.7	0.9	Cao, Y 2016
	Granite		LA-ICP-MS	Zircon	443.6	0.9	Cao, Y 2016
	Granite		LA-ICP-MS	Zircon	443.6	1.4	Cao, Y 2016
	Granite		LA-ICP-MS	Zircon	462	1	Cao, Y 2016
Datong	Quartz monzonite	Sample 10X10-4	LA-ICP-MS	Zircon	470	1.2	Gao X.F., et al., 2013
Datong	Quartz monzonite		LA-ICP-MS	Zircon	459	3	Zhu J et al., 2018
	Monzonite		LA-ICP-MS	Zircon	452	5	Zhu J et al., 2018
Yierba	Granitotoid		TIMS	Zircon	471	5	Yuan et al., 2002
Datong	Granite	10X10-1	LA-ICP-MS	Zircon	470	1.2	Gao et al., 2013
North Kudi	Granitotoid		TIMS	Zircon	405	2	Yuan et al., 2002
South Yutian City			LA-ICP-MS	Zircon	436	2	Zhang QC Lithos 2019
			LA-ICP-MS	Zircon	445	2	Zhang QC Lithos 2019
			LA-ICP-MS	Zircon	442	3	Zhang QC Lithos 2019
	Syenite diorite	17WP28-1	LA-ICP-MS	Zircon	445	3	Wang P et al., GSAB 2020
	Syenite diorite	17WP40	LA-ICP-MS	Zircon	446	2	Wang P et al., GSAB 2020

	Granodiorite	17WP29-2	LA-ICP-MS	Zircon	446	2	Wang P et al., GSAB 2020
	MME	17WP34-2	LA-ICP-MS	Zircon	441	2	Wang P et al., GSAB 2020
	Gabbro	17WP35	LA-ICP-MS	Zircon	448	2	Wang P et al., GSAB 2020
	Gabbro	17WP36	LA-ICP-MS	Zircon	446	2	Wang P et al., GSAB 2020
	Gabbroic diorite	17WP48	LA-ICP-MS	Zircon	440	2	Wang P et al., GSAB 2020
Kudi ophiolite			LA-ICP-MS	Zircon	516	2	Wang P et al., Lithos 2020
			LA-ICP-MS	Zircon	513	4	Wang P et al., Lithos 2020
			LA-ICP-MS	Zircon	512	5	Wang P et al., Lithos 2020
Saitula Group	Monzogranite	WK1608	LA-ICP-MS	Zircon	513.1	2.1	Yin JY et al., 2020
		WK1618	LA-ICP-MS	Zircon	532.8	3.7	Yin JY et al., 2020
Alamas	Gneissic granodiorite	2015D08	LA-ICP-MS	Zircon	481.4	2.1	Zhang CL et al., 2019
	Granofels	2015D017	LA-ICP-MS	Zircon	480.7	1.6	Zhang CL et al., 2019
	Gabbros	2015D16-1	LA-ICP-MS	Zircon	470.2	2.2	Zhang CL et al., 2019
	Gneissic granodiorite pluton	2015D014	LA-ICP-MS	Zircon	445	1.9	Zhang CL et al., 2019
	Dyke	2015D012-3	LA-ICP-MS	Zircon	442.8	1.6	Zhang CL et al., 2019
	Monazite	2015D013	LA-ICP-MS	Zircon	440.1	1.8	Zhang CL et al., 2019
Wulu'ate Formation	Granitoid	AHg13	LA-ICP-MS	Zircon	445.6	2.5	Zhang QC et al., 2016
Kudi ophiolite	Basalt	12X07-1TW	LA-ICP-MS	Zircon	313	4.9	Yun J 2015
Kudi ophiolite	Yixieke dacite	Sample 123	SHRIMP	Zircon	492	9	Xiao et al., 2005
Alamas Pluton	North Kdui garnite	Sample 122	SHRIMP	Zircon	408	8	Xiao et al., 2005
	Leuco-gabbro pegmatite	sample 120	SHRIMP	Zircon	403	7	Xiao et al., 2005
Kayedi pluton	Granodiorite		LA-ICP-MS	Zircon	419	2.8	Liu Y et al., 2015
	Aqiangyan Formation volcanic rocks		LA-ICP-MS	Zircon	474	3	Wang QX 2015
Sunake area	Granitoid	KYD-03	LA-ICP-MS	Zircon	455	2	Zhang QC Acta Geologica Sinica 2019
	Mafic dike	KYDM-03	LA-ICP-MS	Zircon	436	2	Zhang QC Acta Geologica Sinica 2019
Keerliang	Granodiorite		LA-ICP-MS	Zircon	477	2.1	Chen, GM et al., 2020
		D261	SHRIMP	Zircon	466.7	2	Chen, GM et al., 2020
Mengubao-Pushou		D249	SHRIMP	Zircon	429.6	1.4	Yang S et al., 2017
	Biotite quartz monzonite		LA-ICP-MS	Zircon	443.1	2.3	Cui, JT et al., 2007
Busilajin			LA-ICP-MS	Zircon	430.7	2.6	Cui, JT et al., 2007
			LA-ICP-MS	Zircon	446.2	2.2	Yu, X.F., et al., 2011
Busilajin		1	LA-ICP-MS	Zircon	448.7	2.3	Yu, X.F., et al., 2011
Qiukesu	Granite	X10-10-2	LA-ICP-MS	Zircon	434.7	7.8	Jia RY 2013
		X10-10-1	LA-ICP-MS	Zircon	446.9	7	Jia RY 2013
Kayeddi pluton	Two-mica granitoid		LA-ICP-MS	Zircon	436	2	Zhang, Q.C., 2019
	Mafic dike		LA-ICP-MS	Zircon	466	2	Zhang, Q.C., 2019
Kudi area	lamprophyre dikes		Ar-Ar	Hornblende	404	12	Zhou and Li 2000
Kudi ophiolite	Akarz granite	Sample 119	SHRIMP	Zircon	213	3	Xiao et al., 2005

Arkarz	Granodiorite	XKL12-95host	LA-ICP-MS	Zircon	224	1.5	Zhang Y et al., 2016
Arkarz	Granodiorite	XKL12-96host	LA-ICP-MS	Zircon	225.5	2.9	Zhang Y et al., 2016
Arkarz	MME	XKL12-95MME	LA-ICP-MS	Zircon	224.8	3.7	Zhang Y et al., 2016
Arkarz	MME	XKL12-117MME	LA-ICP-MS	Zircon	224.6	2.7	Zhang Y et al., 2016
Arkarz	Granitotoid		TIMS	Zircon	215	1	Yuan et al., 2002
Arkarz	Granitotoid		TIMS	Zircon	212	2	Yuan et al., 2002
Arkarz	Arkarz Shan Intrusive Complex		Ar-Ar	Biotite	214	1	Yuan C et al., 2003
South Kudi	Granot	X10-37	SHRIMP	Zircon	215	2.3	Liu et al., 2015
Arkarz	Granodiorite	X10-34-1	SHRIMP	Zircon	212.7	3.1	Liu et al., 2015
Bulunkou	Granite	07TS-34	LA-ICP-MS	Zircon	236	2	Wang et al., 2015
Bulunkou	MME	07TS-35	LA-ICP-MS	Zircon	230	7	Wang et al., 2015
Akazishan	Monzogranite	07TS-57	LA-ICP-MS	Zircon	208	1	Wang et al., 2015
Taer	Granite	TE-1-1	SHRIMP	Zircon	234.2	2.8	Liao et al., 2012
Taer	Monzogabbro	TE-1-2	SHRIMP	Zircon	220.3	3.3	Liao et al., 2012
Taer	Granite	TE-2-1	SHRIMP	Zircon	224.9	3.9	Liao et al., 2012
Taer	Monzogabbro	TE-2-3	SHRIMP	Zircon	226.9	4	Liao et al., 2012
Taer	Quartz monzonite	TE-6-1	SHRIMP	Zircon	232.4	4	Liao et al., 2012
Taer	Monzodiorite	TE-6-3	SHRIMP	Zircon	233.3	3	Liao et al., 2012
Oytage	Plagigranite	WYT-5	SHRIMP	Zircon	327	4.9	Jiang et al., 2008
Oytage	Plagigranite	GZ-1	SHRIMP	Zircon	337.5	4.1	Jiang et al., 2008
Oytage	Plagiogranite		LA-ICP-MS	Zircon	291.6	1.7	Ji WH et al., 2018
Oytage	Granite	10x-01	LA-ICP-MS	Zircon	322.8	2.2	Kang el al.,2015
Oytage	Granite	FAY-5	LA-ICP-MS	Zircon	337.5	6.5	Li et al., 2009
Oytage	Granite	FGZ-15	LA-ICP-MS	Zircon	339.2	6.5	Li et al., 2009
Yuqikapa	Syenogranite	GG-2	SHRIMP	Zircon	242.9	2.6	Jiang et al., 2013
Muztaga	Granodiorite	MS-11-1	SHRIMP	Zircon	230.3	5	Jiang et al., 2013
Muztaga	MMES	MS-11-4	SHRIMP	Zircon	225.9	2.2	Jiang et al., 2013
Taer	Monzogranite	TE-1-1	SHRIMP	Zircon	234.2	2.8	Jiang et al., 2013
Taer	Plagigranite	TE-2-1	SHRIMP	Zircon	227.1	4.1	Jiang et al., 2013
Taer	MMES	TE-2-3	SHRIMP	Zircon	226.9	4	Jiang et al., 2013
Taer	Monzogranite	TE-6-1	SHRIMP	Zircon	232.4	4	Jiang et al., 2013
Taer	MMES	TE-6-3	SHRIMP	Zircon	233.3	3	Jiang et al., 2013
Taer	Granite		LA-ICP-MS	Zircon	235.7	3.9	Huang et al., 2013
Qitaidaban	Granite		TIMS	Zircon	202.2	3.4	Li GP et al., 2007
Muztaga	Granite		LA-ICP-MS	Zircon	229.6	0.8	Kang el al.,2012
Muztaga	Granite		LA-ICP-MS	Zircon	232.8	1.5	Kang el al.,2012
Saluoyi	Granite	10x-04	LA-ICP-MS	Zircon	319	1.7	Kang el al.,2015
Shangqimugan	Granite	D141-2Zr	LA-ICP-MS	Zircon	228.9	1.7	Chen et al., 2014
Shangqimugan	Granite	D145-3Zr	LA-ICP-MS	Zircon	222.4	2.6	Chen et al., 2014
Kalaguoramu	Granite	KL-118	LA-ICP-MS	Zircon	189.3	2.8	Wu et al., 2013
Shengliqiao	Shengliqiao complex	D9022-JD1	LA-ICP-MS	Zircon	205	1	Zhang CL et al., 2003
		D50-AGE1	LA-ICP-MS	Zircon	230	2.6	Zhang CL et al., 2003
Taer	adamellite		LA-ICP-MS	Zircon	235.7	3.9	Huang, J.G., 2013

Jiajiwaxi	Quartz diorite		LA-ICP-MS	Zircon	224	2	Wang C et al., 2018
			LA-ICP-MS	Zircon	222	2.5	Wang C et al., 2018
Taer	S-type granite		LA-ICP-MS	Zircon	236	4	Huang JG et al., 2016
Kalajila Granite	Granite		LA-ICP-MS	Zircon	223.2	2	Zhang RZ et al., 2018
Mazha	Diabase		LA-ICP-MS	Zircon	287	4.6	Zha, XF., et al., 2018
Mazha tectonic melange	Diorite		LA-ICP-MS	Zircon	338	10	Li, BQ et al., 2007
Muztag Pulton	Melanocratic enclave		LA-ICP-MS	Zircon	218.8	1.9	Liu, ZF., et al., 2017
	Biotite granite		LA-ICP-MS	Zircon	216.48	0.62	Tang HW et al., 2017
Paleo-Tethys Ocean	Qushiman ophiolite	K022/1	LA-ICP-MS	Zircon	324	3.4	Liu CJ 2015
		K023/1	LA-ICP-MS	Zircon	329.3	2.7	Liu CJ 2015
Muztag area	GG-2		LA-ICP-MS	Zircon	242.9	2.6	Liu Z 2015
	MS-11-1		LA-ICP-MS	Zircon	230.3	5	Liu Z 2015
	MS-11-4		LA-ICP-MS	Zircon	225.9	2.2	Liu Z 2015
	TE-1-1		LA-ICP-MS	Zircon	234.2	2.8	Liu Z 2015
	TE2-1		LA-ICP-MS	Zircon	227.1	4.1	Liu Z 2015
	TE-2-3		LA-ICP-MS	Zircon	226.9	4	Liu Z 2015
	TE-6-1		LA-ICP-MS	Zircon	232.4	4	Liu Z 2015
	TE-6-3 MME		LA-ICP-MS	Zircon	233.3	3	Liu Z 2015
	X10-37		LA-ICP-MS	Zircon	215	2.3	Liu Z 2015
	X10-34-1		LA-ICP-MS	Zircon	212.7	3.1	Liu Z 2015
	X10-29		LA-ICP-MS	Zircon	209.2	3.7	Liu Z 2015
North Kudi			LA-ICP-MS	Zircon	244.42	0.87	Bai CD et al., 2019
Mazha (Zhongyangchang)	Meta-rhyolite	2015D056	LA-ICP-MS	Zircon	1970	41	Zhang et al., 2018
	Meta-rhyolite		LA-ICP-MS	Zircon	2523	23	Zhang et al., 2018
	Meta-rhyolite	2015d038	LA-ICP-MS	Zircon	2520	31	Zhang et al., 2018
	Granitic intrusions	2015d029	LA-ICP-MS	Zircon	840	3.2	Zhang et al., 2018
		2015d035	LA-ICP-MS	Zircon	839	3.1	Zhang et al., 2018
		2015d037	LA-ICP-MS	Zircon	838.4	3.1	Zhang et al., 2018
		2015d070	LA-ICP-MS	Zircon	835.4	3.1	Zhang et al., 2018
		2015d032-1	LA-ICP-MS	Zircon	834.1	2.7	Zhang et al., 2018
		2015d032-2	LA-ICP-MS	Zircon	836.2	3.3	Zhang et al., 2018
	Tonalite		LA-ICP-MS	Zircon	836	12	Bian et al., 2013
	Granodiorite		LA-ICP-MS	Zircon	855	14	Bian et al., 2013
Taxkorgan	Meta-andesite		LA-ICP-MS	Zircon	603	10.2	He CG et al., 2019
Bulunkou Group	Meta-volcanic rocks	2015D046	LA-ICP-MS	Zircon	515	1.7	Zhang et al., 2018
	Meta-volcanic rocks	2015D041	LA-ICP-MS	Zircon	508	2	Zhang et al., 2018
	Meta-volcanic rocks	2015D039	LA-ICP-MS	Zircon	518.8	2.3	Zhang et al., 2018
	Gneissic intrusion	2015D05-2	LA-ICP-MS	Zircon	510.8	2.1	Zhang et al., 2018
	Gneissic intrusion	2015D029	LA-ICP-MS	Zircon	513.2	3.7	Zhang et al., 2018
Dahongliutan	Monzonite	DHLTNP	LA-ICP-MS	Zircon	527	2.8	Hu et al., 2016
Dahongliutan	metagabbro	SC	LA-ICP-MS	Zircon	532.3	3.1	Hu et al., 2016

Intermediate-felsic volcanic rocks in Mazha area	PM55-04	LA-ICP-MS	Zircon	513	2.7	Zhang HS et al., 2020	
	PM55-05	LA-ICP-MS	Zircon	514.4	3	Zhang HS et al., 2020	
	PM55-06	LA-ICP-MS	Zircon	519.5	3.4	Zhang HS et al., 2020	
Kulule granite	sample D83	LA-ICP-MS	Zircon	500.7	1.1	Zhang HS et al., 2016	
	D1056	LA-ICP-MS	Zircon	498.7	1.4	Zhang HS et al., 2016	
		LA-ICP-MS	Zircon	513.7	2.1	Yin JY et al., 2020	
		LA-ICP-MS	Zircon	530.9	3	Yin JY et al., 2020	
	Gabbro	15D031	LA-ICP-MS	Zircon	499.8	5.1	Liu XQ et al., 2019
	Gabbro	17KL11	LA-ICP-MS	Zircon	491.4	2.5	Liu XQ et al., 2019
	Granite	17KL04	LA-ICP-MS	Zircon	524.8	2.2	Liu XQ et al., 2019
	Granite		LA-ICP-MS	Zircon	532.7	2.5	Liu XQ et al., 2019
Maeryang area	Garnite		LA-ICP-MS	Zircon	506	6.8	Li RQ et al., 2019
			LA-ICP-MS	Zircon	514	9.3	Li RQ et al., 2019
	Ayilixi granite		LA-ICP-MS	Zircon	530	6	Zhu, J., et al., 2016
	Warengzilafu granite		LA-ICP-MS	Zircon	515	2	Zhu, J., et al., 2016
Zankan area	Dacite	ZKA2-1	LA-ICP-MS	Zircon	533	10	Lin SK 2015
		ZKA9-3	LA-ICP-MS	Zircon	527.4	9	Lin SK 2015
Taaxi	Amphibolite	Tax11	LA-ICP-MS	Zircon	516	6	Hu, J et al., 2020
	Amphibolite	Zk11	LA-ICP-MS	Zircon	520	6	Hu, J et al., 2020
	Amphibolite	MKE24	LA-ICP-MS	Zircon	516	3	Hu, J et al., 2020
Jinnikegaiman Pluton	Monzonitic granite		LA-ICP-MS	Zircon	516.5	0.8	Wei XP et al., 2018
Korliang biotite amphibolite		D2204-1	SHRIMP	Zircon	506.8	9.8	Zhang ZW et al., 2007
Tianshuihu Formation	Trachyte		SHRIMP	Zircon	491.35	5.3	Gu, H., et al., 2017
Dahekou area	Amphibolite		LA-ICP-MS	Zircon	512	3	Wang, ZF et al., 2019
	Basalt	PM07-4	LA-ICP-MS	Zircon	465.1	6.6	Yang C et al., 2020
Waqia	Granodiorite	BL4-1	LA-ICP-MS	Zircon	318.8	3.1	Tang WK et al., 2020
	Granodiorite	BL4-2	LA-ICP-MS	Zircon	322.9	2.1	Tang WK et al., 2020
	Gabbro diorite	BL4-8	LA-ICP-MS	Zircon	319	1.8	Tang WK et al., 2020
	Gabbro diorite	BL4-9	LA-ICP-MS	Zircon	318.5	1.7	Tang WK et al., 2020
	Diorite	BL4-11	LA-ICP-MS	Zircon	318.1	1.3	Tang WK et al., 2020
	Diorite	BL4-12	LA-ICP-MS	Zircon	318.3	1.9	Tang WK et al., 2020
Mazha		X10-29	SHRIMP	Zircon	209.2	3.7	Liu et al., 2015
Dahongliutan	Granite		LA-ICP-MS	Zircon	209.6	1.3	Wei et al., 2017
Dahongliutan	Granite		SHRIMP	Zircon	220	2.2	Wei et al., 2017
Dahongliutan	Granite		SHRIMP	Zircon	217.4	2.2	Qiao et al., 2015
Bandiersirehong	Granodiorite		LA-ICP-MS	Zircon	239	1.5	Lu et al., 2015
	Gneissic intrusion	2015D040	LA-ICP-MS	Zircon	245.2	0.98	Zhang et al., 2018
	Gneissic intrusion	2015D051-1	LA-ICP-MS	Zircon	200.5	1.3	Zhang et al., 2018
	Gneissic intrusion	2015D052	LA-ICP-MS	Zircon	192.88	0.65	Zhang et al., 2018
	Gneissic intrusion	2015D047	LA-ICP-MS	Zircon	186.7	1.4	Zhang et al., 2018
Dujianshan	Mica monzogranite	3047	LA-ICP-MS	Zircon	227	2	Zhang Y et al., 2020
		3049	LA-ICP-MS	Zircon	212	1	Zhang Y et al., 2020

Karaletash group	Felsic sedimentary tuff		LA-ICP-MS	Zircon	282	2	Zhang Y et al., 2021
	Basalt		LA-ICP-MS	Zircon	262.6	2	Zhang Y et al., 2021
Bailongshan	Granodiorite		LA-ICP-MS	Zircon	212.3	1.6	Wang H et al., 2020
	Pegmatite		LA-ICP-MS	Zircon	208.1	1.5	Wang H et al., 2020
Dahongliutan Pluton	Biotite monzogranite		LA-ICP-MS	Zircon	214	1.8	Ding K et al., 2020
Dahongliutan Pluton	Diorite	AKSY-1	LA-ICP-MS	Zircon	216.7	1.8	Wei XP et al., 2018
	Quartz diorite	FLYT-1	LA-ICP-MS	Zircon	213.7	2	Wei XP et al., 2018
Mazha	Biotite granite		LA-ICP-MS	Zircon	204.23	0.51	Tang HW 2017
Muzitage	Granite		LA-ICP-MS	Zircon	213	0.5	Song Y et al., 2015
Muzitage	Granite		LA-ICP-MS	Zircon	215.4	2.6	Song Y et al., 2015
Muzitage	Granite		LA-ICP-MS	Zircon	220.6	0.29	Song Y et al., 2015
Muzitage	Granite		LA-ICP-MS	Zircon	222.1	0.4	Song Y et al., 2015
Qitaidaban Area	Intermediate-Acid Intrusive Rocks	PM001-3	LA-ICP-MS	Zircon	214.7	2	Zhao, JL., et al., 2017
		PM016-2	LA-ICP-MS	Zircon	211.3	3.3	Zhao, JL., et al., 2017
		PM004-2	LA-ICP-MS	Zircon	210.6	2.8	Zhao, JL., et al., 2017
Shazigou	Granodiorite		LA-ICP-MS	Zircon	213.7	2.6	Wang, ZF et al., 2019
Serikedaban	Andesite		LA-ICP-MS	Zircon	223.2	2.2	Liu CJ 2015
Mazha	Granodiorite		LA-ICP-MS	Zircon	221.8	2.3	Liu CJ 2015
Quanshuigou	Granite	K020/8	LA-ICP-MS	Zircon	210	1	Liu CJ 2015
	MME	K020/6	LA-ICP-MS	Zircon	217	2	Liu CJ 2015
Dahongliutan Pluton	Granite		LA-ICP-MS	Zircon	213	2.1	Ding K et al., 2019
Xiqikapa	Granite	YQKP-5	LA-ICP-MS	Zircon	242.7	3.3	Wei XP et al., 2018
	Felsic intrusion	YQKP-9	LA-ICP-MS	Zircon	242.6	2.3	Wei XP et al., 2018
	Felsic intrusion	QTDB-3 host rock	LA-ICP-MS	Zircon	213.3	2.2	Wei XP et al., 2018
	Felsic intrusion	QTDB-2 MME	LA-ICP-MS	Zircon	214.9	3.3	Wei XP et al., 2018
	Felsic intrusion	SSL-3 host rock	LA-ICP-MS	Zircon	216	1.3	Wei XP et al., 2018
	Felsic intrusion	SSL-P MME	LA-ICP-MS	Zircon	215.9	1.4	Wei XP et al., 2018
	Felsic intrusion	SSLW-5	LA-ICP-MS	Zircon	215.7	1.7	Wei XP et al., 2018
	Felsic intrusion	QTD-3 host rock	LA-ICP-MS	Zircon	218.2	1.9	Wei XP et al., 2018
	Felsic intrusion	QTD-5 MME	LA-ICP-MS	Zircon	217.2	1.4	Wei XP et al., 2018
	Felsic intrusion	KZLJK-11 host rock	LA-ICP-MS	Zircon	221.8	2.1	Wei XP et al., 2018
	Felsic intrusion	KZLJK-5 MME	LA-ICP-MS	Zircon	220	2.1	Wei XP et al., 2018
	Felsic intrusion	DHLT-3	LA-ICP-MS	Zircon	209.7	1.3	Wei XP et al., 2018
	Felsic intrusion	MJX-5	LA-ICP-MS	Zircon	208.8	1.8	Wei XP et al., 2018
Quanshuigou	Granodiorite		LA-ICP-MS	Zircon	217.6	0.9	Qiao GB et al., 2018
	Biotite quartz diorite		LA-ICP-MS	Zircon	217.4	0.4	Qiao GB et al., 2018
	Andesitic tuffite		LA-ICP-MS	Zircon	252.9	9.1	Tang MY 2020
Panshuihe area	Granodiorite		LA-ICP-MS	Zircon	210.9	2.8	Tang MY 2020
Subashi ophiolite	Gabbro	D0101-7	LA-ICP-MS	Zircon	352.7	3	Wen, ZG et al., 2019
		D4005-13	LA-ICP-MS	Zircon	261.9	2.2	Wen, ZG et al., 2019

Dahongliutan	Diorite	2018KL05	LA-ICP-MS	Zircon	209.9	1.3	Liu XQ et al., 2020
	Monzogranite	2018kl04-2	LA-ICP-MS	Zircon	198.9	1	Liu XQ et al., 2020
Turuke	Monzogranite	2018KL11	LA-ICP-MS	Zircon	201.9	1.5	Liu XQ et al., 2020
	Monzogranite	2018KL12	LA-ICP-MS	Zircon	197.4	2.1	Liu XQ et al., 2020
Dahongliutan	Pegmatite	2018KL02	LA-ICP-MS	Zircon	196.1	1	Liu XQ et al., 2020
			LA-ICP-MS	Zircon	195.2	1.5	Liu XQ et al., 2020
Along Rushan-Pshart suture	Granite	BL3-1	LA-ICP-MS	Zircon	206.2	1.4	Wang SF et al., 2020
	Granite	BL3-2	LA-ICP-MS	Zircon	206	1.4	Wang SF et al., 2020
	Granite	BL3-4	LA-ICP-MS	Zircon	205.3	1.9	Wang SF et al., 2020
	Granite	BL6-7	LA-ICP-MS	Zircon	204.2	0.6	Wang SF et al., 2020
	Granite	MT-1	LA-ICP-MS	Zircon	200.9	0.6	Wang SF et al., 2020
	Granite	MT-2	LA-ICP-MS	Zircon	200	0.5	Wang SF et al., 2020
	Granodiorite	BL7-1	LA-ICP-MS	Zircon	206.6	0.6	Wang SF et al., 2020
	Granodiorite	BL7-2	LA-ICP-MS	Zircon	204.2	0.5	Wang SF et al., 2020
	Granodiorite	BL-3	LA-ICP-MS	Zircon	203.5	0.5	Wang SF et al., 2020

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Table S3 Compiled samples for Neoproterozoic-Silurian strata in South Tarim

Sample No.	Petrology	Depositional age/Ma	Source
Western Kunlun			
17WP53	Sandstone	431	Wang et al., 2020a
18WP59	Sandstone	560	Wang et al., 2020a
18WP62	Sandstone	604	Wang et al., 2020a
17WP106	Schist	800	Wang et al., 2020b
17WP103	Schist	800	Wang et al., 2020b
17WP102	Schist	800	Wang et al., 2020b
17WP100	Schist	800	Wang et al., 2020b
17WP97	Schist	800	Wang et al., 2020b
17WP47	Quartzite	1020	Wang et al., 2020b
17WP55	Quartzite	1021	Wang et al., 2020b
2015D008+2015D012	Paragneiss (Saitula Group)	520	Zhang et al., 2019
2015D001	Sandstone (Tianhuihan Group)	734	Zhang et al., 2019
2015D019	Sandstone (Tianhuihan Group)	743	Zhang et al., 2019
2015D034	Schist (Bulunkuole Group)	520-510	Zhang et al., 2018
2015D043	Schist (Bulunkuole Group)	520-510	Zhang et al., 2018
2015D044	Schist (Bulunkuole Group)	520-510	Zhang et al., 2018
2015D045	Schist (Bulunkuole Group)	520-510	Zhang et al., 2018
2013TP11	Schist (Ailankata Group)	800	Zhang et al., 2016
2013TR12	Schist (Ailankata Group)	800	Zhang et al., 2016
2013TR14	Schist (Ailankata Group)	800	Zhang et al., 2016
2013TR15	Schist (Ailankata Group)	800	Zhang et al., 2016
2013TR08	Qiakemakelieke Group	732	Zhang et al., 2016
2015D27	Qiakemakelieke Group	732	Zhang et al., 2016
2015D28	Qiakemakelieke Group	732	Zhang et al., 2016
11YL-1	Schist (Ailankata Group)	634	Wang et al., 2015
12TK-19	Schist (Ailankata Group)	715	Wang et al., 2015
10TK-80	Schist (Ailankata Group)	654	Wang et al., 2015
10TK-85	Schist (Ailankata Group)	731	Wang et al., 2015
12TK-14	Sandstone (Qiakemaklike)	674	Wang et al., 2015
12TK-8	Conglomerate	793	Wang et al., 2015
10TK-75	Sandstone (Qiakemaklike)	668	Wang et al., 2015
10TK-73	Sandstone (Sululuoke)	630	Wang et al., 2015
11XZ-2	Conglomerate	773	Wang et al., 2015
13WKL-19	Conglomerate	797	Wang et al., 2015b
17WP12	Sandstone	453	Wang et al., 2020c
17WP13	Sandstone	443	Wang et al., 2020c
Altyn Tagh			
17LQ49-1A	Litharenite	494	Liu et al., 2020a
17LQ47-5A	Litharenite	477	Liu et al., 2020a
17LQ47-13A	Litharenite	472	Liu et al., 2020a
17LQ47-1A	Litharenite	447	Liu et al., 2020a
17LQ47-10A	Sandstone	446	Liu et al., 2020a
17LQ47-11A	Litharenite	444	Liu et al., 2020a
17LQ11-1A	Litharenite	482	Liu et al., 2020a

17LQ07-1A	Litharenite	479	Liu et al., 2020a
17LQ08-3A	Litharenite	471	Liu et al., 2020a
17LQ04-1A	Sandstone	465	Liu et al., 2020a
18LQ50	Sandstone	456	Liu et al., 2020a
17LQ16-1A	Sandstone	455	Liu et al., 2020a
18LQ31	Sandstone	437	Liu et al., 2020a
18LQ32	Sandstone	426	Liu et al., 2020a
17LQ50-1A	Quartz schist	888	Liu et al., 2020b
Eastern Kunlun			
18WP84-2		417	Wang et al., 2020c
18WP89-2		537	Wang et al., 2020c
18WP102		602	Wang et al., 2020c

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Table S4 Compiled samples for Neoproterozoic-Ordovician strata in North India.

Sample No.	Depositional age	Source
In 1	Neoproterozoic	Hofmann et al., 2011
In 5b	Neoproterozoic	Hofmann et al., 2011
In 22	Cambrian	Hofmann et al., 2011
In 34	Neoproterozoic	Hofmann et al., 2011
In 51	Neoproterozoic	Hofmann et al., 2011
RJW14104	Early Cambrian	Wang et al., 2018
RJW1427	Early Cambrian	Wang et al., 2018
DLW1473	Neoproterozoic	Wang et al., 2018
KU-2	Mid. Cambrian	Myrow et al., 2016
MS-5	Ordovician	Myrow et al., 2016
Tal-GKM	Mid Cambrian	Myrow et al., 2016
MS-2	Early Cambrian	Myrow et al., 2016
KD-1	Early Cambrian	Myrow et al., 2016
BU07-56	Ordovician	Myrow et al., 2016
Tal	Early Cambrian	Myrow et al., 2016
GKB56	Ordovician	Myrow et al., 2016
WL-1	Cambrian	Hughes et al., 2011
WL-270.75	Cambrian	Hughes et al., 2011
MBQ	Ordovician	Myrow et al., 2010
KU-2	Mid. Cambrian	Myrow et al., 2010
Tal	Early Cambrian	Myrow et al., 2010
Thango	Ordovician	Myrow et al., 2010
MS-5	Ordovician	Myrow et al., 2010
PV	Early Cambrian	Myrow et al., 2010
MS-2	Cambrian	Myrow et al., 2010
Batal	Early Cambrian	Myrow et al., 2010
NY-11	Mid. Cambrian	Myrow et al., 2010
Tal-GKM	Cambrian	Myrow et al., 2010
WL-270	Cambrian	Myrow et al., 2010
Kaimur	Ediacaran-Cambrian	Turner et al., 2014
Rewa SS	Ediacaran-Cambrian	Turner et al., 2014
Bhander SS	Ediacaran-Cambrian	Turner et al., 2014
Bhander Great	Ediacaran-Cambrian	Turner et al., 2014
Bundi Bhander SS	Ediacaran-Cambrian	Turner et al., 2014
Pghs (Garhwal)	Neoproterozoic	Spencer et al., 2012
BD1437	Neoproterozoic-Ordovician	Spencer et al., 2019
BD1441	Neoproterozoic-Ordovician	Spencer et al., 2019
SK12-32	Neoproterozoic-Ordovician	Spencer et al., 2019
SK12-161	Neoproterozoic-Ordovician	Spencer et al., 2019
SK12-115	Neoproterozoic-Ordovician	Spencer et al., 2019
SK12-280	Neoproterozoic-Ordovician	Spencer et al., 2019
SK12-211	Neoproterozoic-Ordovician	Spencer et al., 2019

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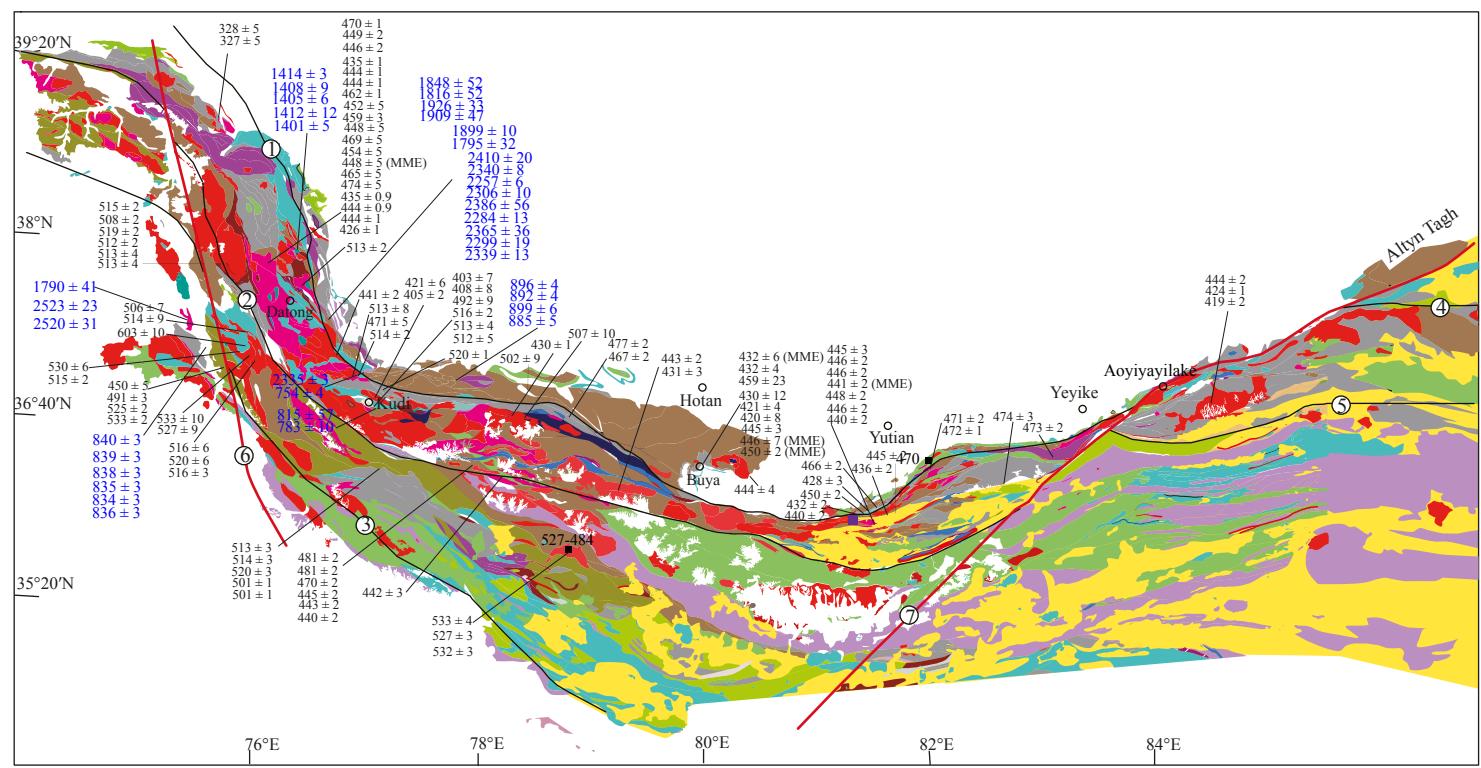
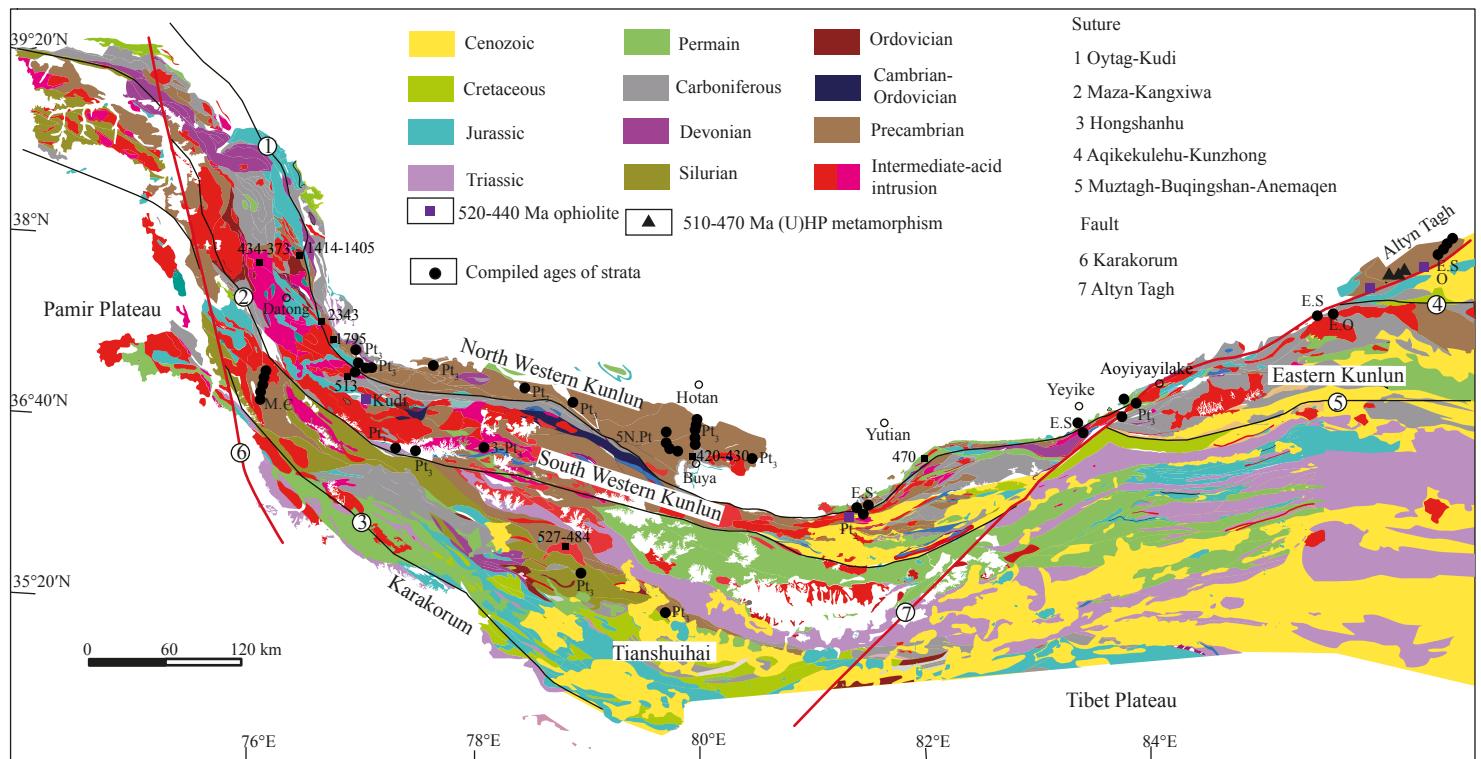


Fig. S1

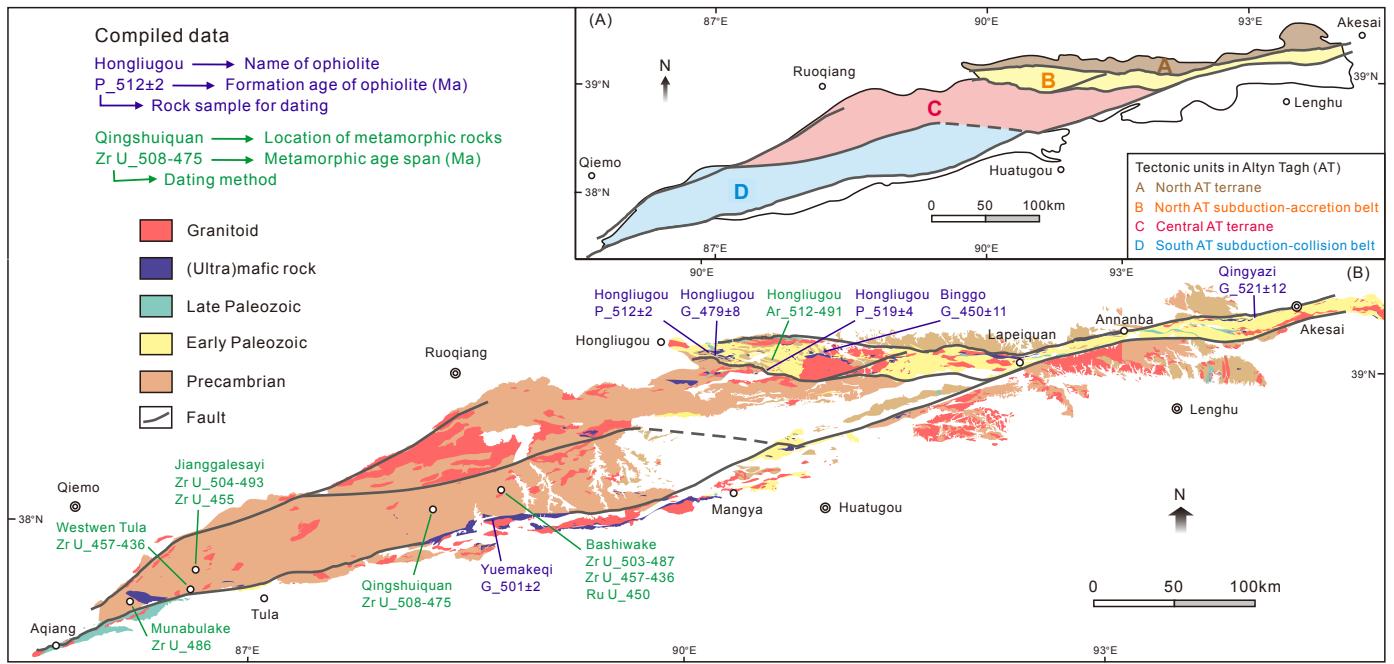


Fig. S2

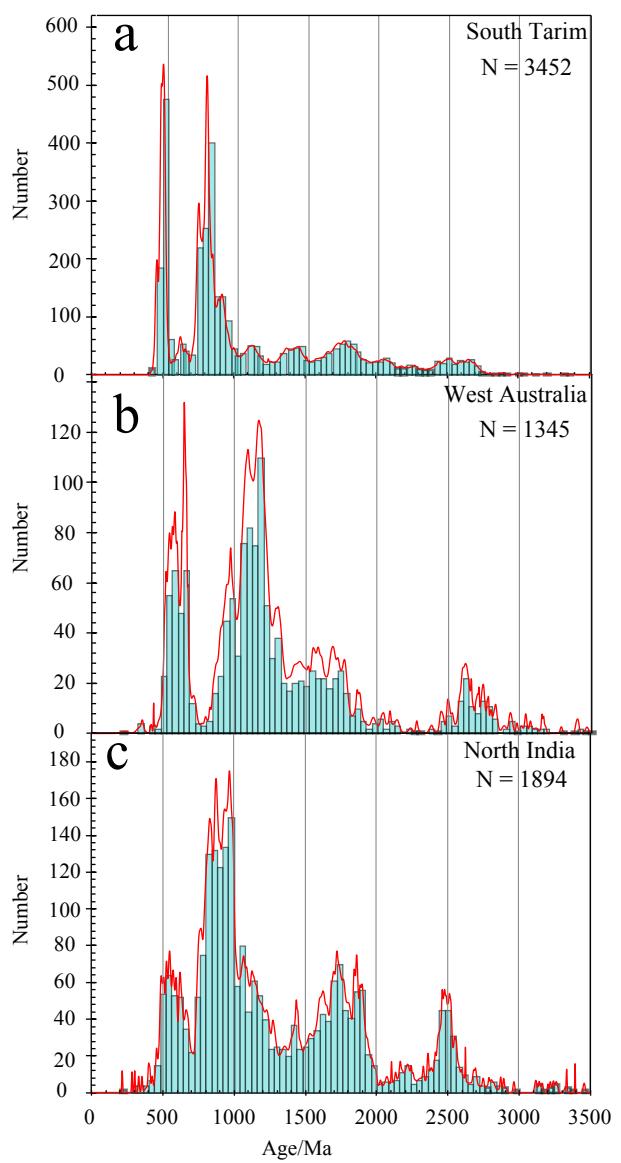


Fig. S3