

Tectonics

Supporting Information for

The geodynamic significance of continental UHP exhumation: New constraints from Tso Morari Complex, NW Himalaya

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1.1. Supporting Information 1. Geochronology of the northwest Himalaya

1.1.1. Table A1: Published geochronology results from Tso Morari and Kaghan.

Additional Supporting Information (Files uploaded separately)

The EPMA, LA-ICPMS and ID-TIMS data used for geochemistry analysis and U-Pb dating in this study has been uploaded to the Mendeley data repository with a DOI and an open access license CC BY 4.0.

Introduction

A summary of the published geochronology of the Tso Morari Complex:

Rock type	Sample number	Age (Ma)	Mineral	Method	Interpretation	Reference
Tso Morari						
Retrogressed eclogite	CM71710-4	45.3±1.6	Zircon	U-Pb	Eclogite facies	Donaldson et al. (2013)
Retrogressed eclogite	DD71710-2b	44.2±1.2	Zircon	U-Pb	Eclogite facies	Donaldson et al. (2013)
Retrogressed eclogite	L08-03A	58.0 ± 2.2	Zircon	U-Pb shrimp	Prograde	St-Onge et al (2013)
Retrogressed eclogite	L08-03A	50.8 ± 1	Zircon	U-Pb shrimp	UHP	St-Onge et al (2013)
Puga gneiss	L08-03E/F	45.3 ± 1.1	Monazite	Th-Pb shrimp	Amphibolite facies	St-Onge et al (2013)
Puga gneiss	L08-03E/F	43.3 ± 1.1	Allanite	U-Pb shrimp	Amphibolite facies	St-Onge et al (2013)
Granite gneiss	T18, T38	53.3 ± 0.7	Zircon	U-Pb shrimp	UHP	Leech et al (2007)
Granite gneiss	T18, T38	50.1 ± 0.6	Zircon	U-Pb shrimp	Eclogite facies	Leech et al (2007)
Granite gneiss	T18, T38	47 ± 0.5	Zircon	U-Pb shrimp	Amphibolite facies	Leech et al (2007)
Granite gneiss	T18, T38	45.2 ± 0.7	Zircon	U-Pb shrimp	Amphibolite facies	Leech et al (2007)
Puga gneiss	n/a	51.1 ± 0.1	Biotite	Ar/Ar	<300°C	Schlup and Carter (2003)
Metapelite	n/a	14.1 ± 1.3	Apatite	Fission track	<120°C	Schlup and Carter (2003)
Metapelite	n/a	34-45 ± 2	Zircon	Fission track	<120°C	Schlup and Carter (2003)
Puga gneiss	n/a	7.5 ± 3	Apatite	Fission track	<120°C	Schlup and Carter (2003)
Puga gneiss	n/a	13.2-16.4 ± 3	Apatite	Fission track	<120°C	Schlup and Carter (2003)
Puga gneiss	n/a	21-23.4 ± 3	Apatite	Fission track	<120°C	Schlup and Carter (2003)
Retrogressed eclogite	Ch157a	55 ± 7	Grt-Gln-WR	Sm/Nd	Eclogite facies	De Sigoyer et al (2000)
Amphibolite	Ts34	55 ± 12	Grt-Cpx-WR	Lu/Hf	Eclogite facies	De Sigoyer et al (2000)
Metapelite	n/a	55 ± 17	Allanite	U-Pb	Eclogite facies	De Sigoyer et al (1999)
Retrogressed eclogite	Ts45	47 ± 11	Grt-Gln-WR	Sm/Nd	Amphibolite facies	De Sigoyer et al (2000)
Metapelite	Ch165	48 ± 2	Phengite	Ar/Ar	Amphibolite facies	De Sigoyer et al (2000)
Metapelite	Ch223	45 ± 4.4	Phe-Ap-WR	Rb/Sr	Amphibolite facies	De Sigoyer et al (2000)
Metapelite	Lk93-42/40	31.1 ± 0.3	Muscovite	Ar/Ar	<300°C	De Sigoyer et al (2000)

Metapelite	Lk93-42/40	29 ± 0.4	Biotite	Ar/Ar	<300°C	De Sigoyer et al (2000)
Metapelite	Lk93-42/40	29.3 ± 0.3	Biotite	Ar/Ar	<300°C	De Sigoyer et al (2000)
Granite	As9660	479 ± 2	Zircon	U-Pb	Igneous	Girard and Bussy (1999)
Puga gneiss	G9628	479 ± 2	Zircon	U-Pb	Igneous	Girard and Bussy (1999)
Rupshu granite	V9692	482.5 ± 1	Zircon	U-Pb	Igneous	Girard and Bussy (1999)
Kaghan valley						
Retrogressed eclogite	Kv4	46.4 ± 0.1	Zircon	U-Pb ID-TIMS	Eclogite facies	Parrish et al., (2006)
Granite gneiss	Kv16	45.5 ± 6.6	Zircon	U-Pb ID-TIMS	Eclogite facies	Parrish et al., (2006)
Granite gneiss	Kv16	46.5 ± 1.0	Allanite	U-Pb ID-TIMS	Eclogite facies	Parrish et al., (2006)
Retrogressed eclogite	2016PK39 and 2016PK43-2	46 ± 2.0 Ma	Zircon	U-Pb SIMS	Eclogite facies	Zhang et al., (2022)
Granite gneiss	Kv16	44-46.4	Titanite	U-Pb ID-TIMS	Amphibolite facies	Parrish et al., (2006)
Eclogite	n/a	44.1	Rutile	U-Pb ID-TIMS	Amphibolite facies	Treloar et al. (2003)
Retrogressed eclogite	n/a	46.2 ± 0.7	Zircon	U-Pb shrimp	Eclogite facies	Kaneko et al., (2003)
Orthogneiss	H65 and H37	47 to 39 ± 1.0	Titanite	LA-SS-ICP-MS	Amphibolite facies	Soret et al., (2020)
Gneiss	K4-119	47.3 ± 0.3	Phengite	Ar/Ar	Eclogite facies	Wilke et al. (2010)
Gneiss	K3-26	47.3 ± 0.4	Zircon	U-Pb LA-ICP-MS	Eclogite facies	Wilke et al. (2010)
Retrogressed eclogite	K4-99	46.6 ± 0.5	Amphibole	Ar/Ar	Amphibolite facies	Wilke et al. (2010)
Retrogressed eclogite	K4-60	44.1 ± 0.3	Rutile	U-Pb LA-ICP-MS	Amphibolite facies	Wilke et al. (2010)
	K4-71	41.3 ± 4.7	Titanite	U-Pb LA-ICP-MS	Amphibolite facies	Wilke et al. (2010)
Gneiss	K4-97	34.5 ± 0.2	Phengite	Ar/Ar	Amphibolite facies	Wilke et al. (2010)
Gneiss	K4-21	28.1 ± 0.2	Biotite	Ar/Ar	Amphibolite facies	Wilke et al. (2010)
Gneiss	K4-99	23.6 ± 0.1	Biotite	Ar/Ar	Amphibolite facies	Wilke et al. (2010)
Gneiss	K4-37	21.7 ± 0.2	Biotite	Ar/Ar	Amphibolite facies	Wilke et al. (2010)
Stak massif						
Retrogressed eclogite	n/a	51.3 ± 0.7 and 60.4 ± 0.6	Zircon	U-Pb shrimp	Eclogite facies	Riel et al., (2008)

Table 1. Published geochronology results from Tso Morari, Kaghan and Stak. Sample numbers not available designated as n/a. Also shown in Figure 8.

Data Set S1. <https://doi.org/10.17632/vcfbxm6h9f.1>

- Supporting Information 2. EPMA methods and data.
 - Methods
 - Table B1: EPMA data

Data Set S1. <https://doi.org/10.17632/t5fd58m67p.1>

- Supporting Information 3: Geochronology data.
 - Summary
 - ID-TIMS Zircon U-Pb
 - Laser Ablation Xenotime U-Pb
 - Laser Ablation Rutile U-Pb
 - Laser Ablation Zircon U-Pb
 - Laser Ablation Zircon trace elements
 - Run conditions Zircon
 - Run conditions Rutile
 - Run conditions trace elements