

Fig. S1. Geological route map around the outcrops of the metabasite body. The location of this area is shown in Fig. 1.

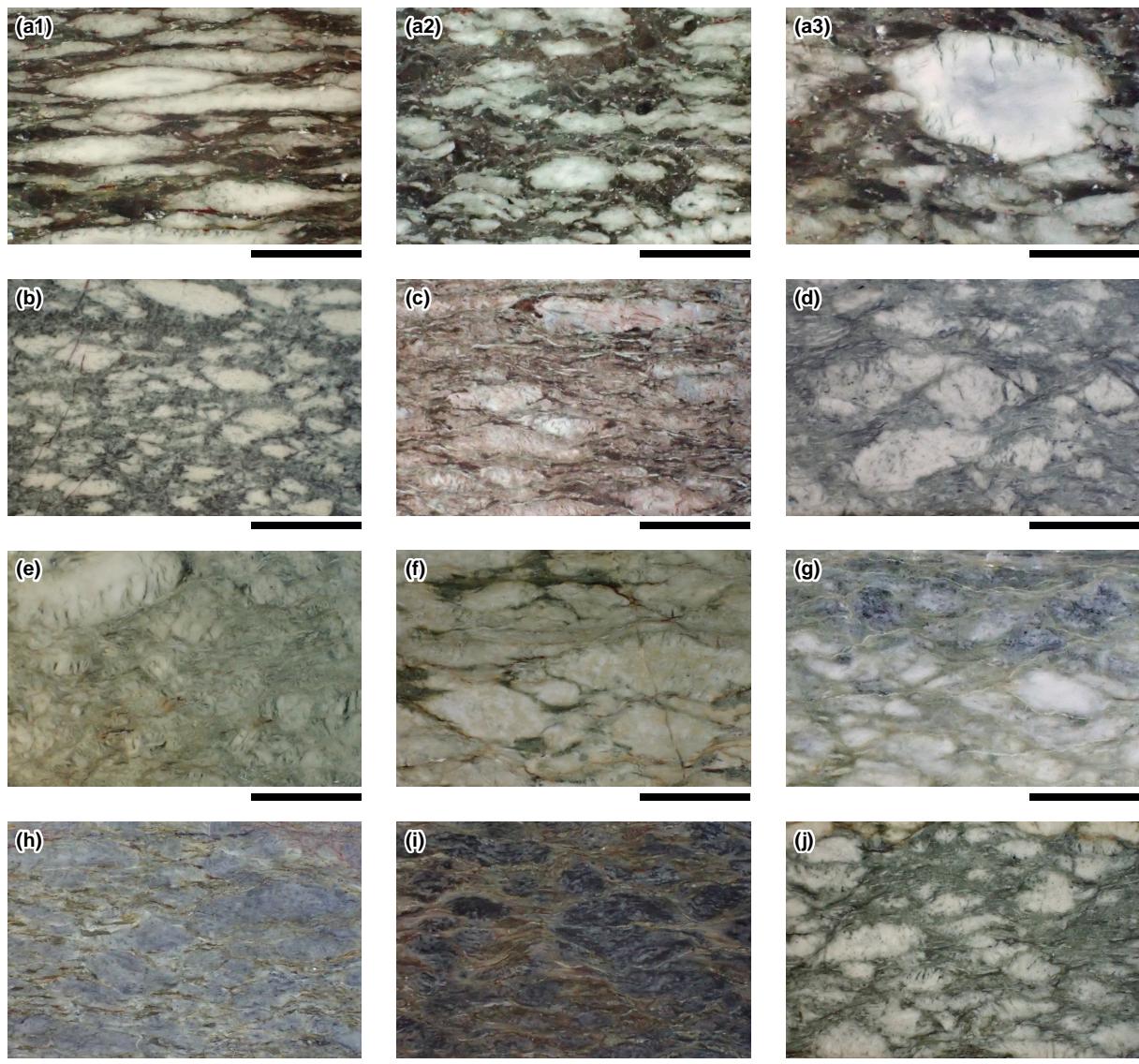


Fig. S2. Rock sections. (a–d) Color images of (a–d) of Fig. 3. (e–i) Metabasite clasts sampled from the basal conglomerate of the Hiwadatoge Formation unconformably overlying the metabasite at outcrop NM-MGB003. (j) Metabasite clast sampled from the basal conglomerate of the Hiwadatoge Formation exposed at Nakajo. The location of the outcrop is indicated by the white star (B) in Fig. 1. The scale bars equal 1 cm.

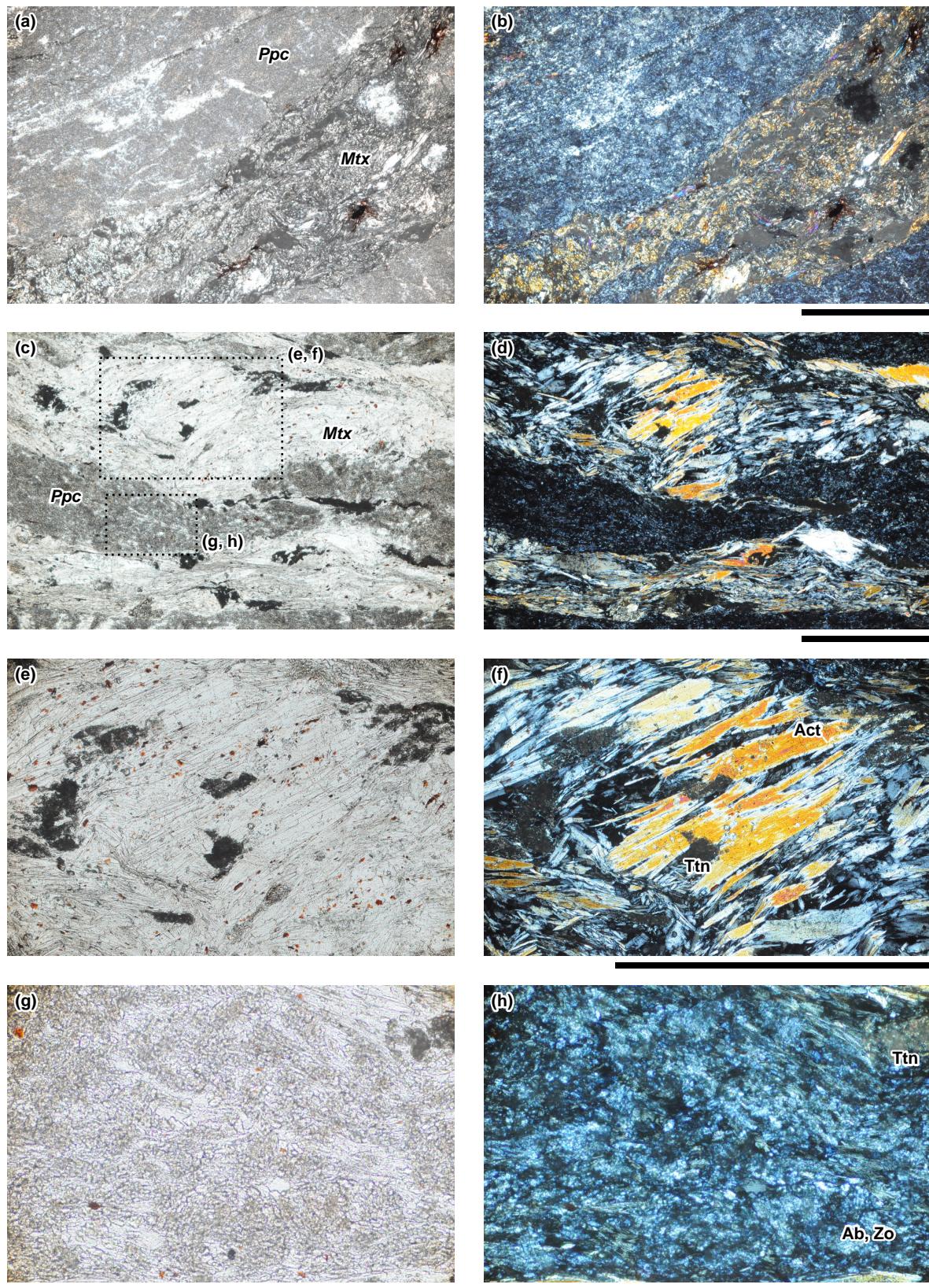


Fig. S3. Photomicrographs of a metabasite sample collected at outcrop NM-MGB002 under (a, c, e, g) plane-polarized light and (b, d, f, h) cross-polarized light. (a, b) Color images of (a, b) of Fig. 4. The scale bars for (a, b), (c, d) and (e, f) equal 1 mm, and that for (g, h) equals 0.5 mm. Abbreviations: Act, actinolite; Al, albite; Mtx, matrix; Ppc, “porphyroblast”; Ttn, titanite, Zo, zoisite.

Table S1. SEM-EDS data (wt%) for minerals within the metabasite samples collected from outcrop NM-MGB002 and the basal conglomerate of the Hiwadatoge Formation (outcrop NM-MGB003; samples NM-HTFg116 and 310). Abbreviations: Chl, chlorite; Phn, phengite; Ttn, titanite. “–” indicates below the detection limit.

Rock body sample (NM-MGB002)										Matrix			
	Albite			Zoisite			Actinolite		Actinolite		Chl	Ttn	
SiO ₂	67.38	67.81	67.10	38.35	38.79	37.70	55.23	55.47	55.43	55.84	28.09	30.36	
TiO ₂	–	–	–	–	–	–	–	–	–	–	–	36.86	
Al ₂ O ₃	18.92	19.24	19.29	29.27	29.16	29.02	1.96	0.62	1.33	0.96	19.63	1.65	
FeO*	–	–	–				8.55	7.24	8.77	7.39	15.95	–	
Fe ₂ O ₃ **				5.09	5.07	5.31							
MnO	–	–	–	–	–	–	–	–	–	–	0.46	–	
MgO	–	–	–	–	–	–	19.32	20.39	19.33	20.06	22.86	–	
CaO	0.28	0.21	0.33	24.59	24.54	24.16	12.42	13.23	11.89	13.27	–	28.89	
Na ₂ O	11.25	11.63	11.64	–	–	–	0.39	–	0.63	–	–	–	
Total	97.83	98.89	98.36	97.30	97.56	96.19	97.87	96.95	97.38	97.52	86.99	97.76	
O =	8	8	8	12.5	12.5	12.5	23	23	23	23	14	5	
Si	3.00	3.00	2.98	2.99	3.01	2.97	7.77	7.84	7.84	7.85	2.84	1.01	
Ti	–	–	–	–	–	–	–	–	–	–	–	0.92	
Al	0.99	1.00	1.01	2.69	2.67	2.70	0.33	0.10	0.22	0.16	2.34	0.07	
Fe ²⁺	–	–	–				1.01	0.86	1.04	0.87	1.35	–	
Fe ³⁺				0.30	0.30	0.32							
Mn	–	–	–	–	–	–	–	–	–	–	0.04	–	
Mg	–	–	–	–	–	–	4.05	4.30	4.07	4.20	3.44	–	
Ca	0.01	0.01	0.02	2.05	2.04	2.04	1.87	2.00	1.80	2.00	–	1.03	
Na	0.97	1.00	1.00	–	–	–	0.11	–	0.17	–	–	–	
Total	4.97	5.01	5.01	8.03	8.02	8.03	15.14	15.10	15.14	15.08	10.01	3.03	
Gravel sample (NM-HTFg116)													
	“Porphyroblast”						Matrix						
	Albite			Zoisite			Chl	Phn	Actinolite		Chl	Ttn	
SiO ₂	67.64	67.04	66.79	37.78	38.10	37.81	29.63	49.79	54.67	54.87	27.56	29.93	
TiO ₂	–	–	–	–	–	–	–	–	–	–	–	38.29	
Al ₂ O ₃	19.01	19.35	19.51	28.36	30.08	28.01	20.07	26.39	0.43	1.71	19.44	1.57	
FeO*	–	–	–				17.10	1.98	8.63	9.32	17.64	–	
Fe ₂ O ₃ **				6.39	3.86	6.95							
MgO	–	–	–	–	–	–	19.52	3.40	19.55	18.95	21.76	–	
CaO	–	–	–	24.51	24.37	24.02	–	2.57	12.96	13.06	–	28.79	
Na ₂ O	11.32	11.29	11.27	–	–	–	–	–	–	–	–	–	
K ₂ O	–	–	–	–	–	–	–	9.90	–	–	–	–	
Total	97.97	97.68	97.57	97.04	96.41	96.79	86.32	94.03	96.24	97.91	86.40	98.58	
O =	8	8	8	12.5	12.5	12.5	14	11	23	23	14	5	
Si	3.01	2.99	2.99	2.97	2.98	2.98	3.00	3.38	7.84	7.75	2.82	0.99	
Ti	–	–	–	–	–	–	–	–	–	–	–	0.95	
Al	1.00	1.02	1.03	2.63	2.77	2.60	2.40	2.11	0.07	0.29	2.35	0.06	
Fe ²⁺	–	–	–				1.45	0.11	1.04	1.10	1.51	–	
Fe ³⁺				0.38	0.23	0.41							
Mg	–	–	–	–	–	–	2.95	0.34	4.18	3.99	3.32	–	
Ca	–	–	–	2.06	2.04	2.03	–	0.19	1.99	1.98	–	1.02	
Na	0.98	0.98	0.98	–	–	–	–	–	–	–	–	–	
K	–	–	–	–	–	–	–	0.86	–	–	–	–	
Total	4.99	4.99	5.00	8.04	8.02	8.02	9.80	6.99	15.12	15.11	10.00	3.02	

* All Fe as FeO.

** All Fe as Fe₂O₃.

Table S1. Continued.

Gravel sample (NM-HTFg310)											
	“Porphyroblast”						Matrix				
	Albite			Zoisite			Chl	Actinolite	Chl	Ttn	
SiO ₂	68.31	68.39	67.95	38.77	38.91	39.28	29.28	54.54	53.68	28.18	29.54
TiO ₂	—	—	—	—	—	—	—	—	—	—	38.78
Al ₂ O ₃	19.56	19.70	19.83	29.64	29.36	30.15	19.79	2.43	2.35	20.54	1.00
FeO*	—	—	—				14.88	9.31	9.58	15.17	—
Fe ₂ O ₃ **				6.08	6.69	5.11					
MnO	—	—	—	—	—	—	0.38	—	—	0.16	—
MgO	—	—	—	—	—	—	25.47	18.39	17.91	24.36	—
CaO	—	0.50	0.60	24.41	25.39	25.10	—	12.75	12.99	—	28.78
Na ₂ O	11.62	11.54	11.69	—	—	—	—	0.52	0.39	—	—
Total	99.49	100.13	100.07	98.90	100.35	99.64	89.80	97.94	96.90	88.41	98.10
O =	8	8	8	12.5	12.5	12.5	14	23	23	14	5
Si	3.00	2.98	2.97	2.97	2.96	2.98	2.84	7.71	7.69	2.78	0.98
Ti	—	—	—	—	—	—	—	—	—	—	0.97
Al	1.01	1.01	1.02	2.68	2.63	2.70	2.26	0.41	0.40	2.39	0.04
Fe ²⁺	—	—	—				1.21	1.10	1.15	1.25	—
Fe ³⁺				0.35	0.38	0.29					
Mn	—	—	—	—	—	—	0.03	—	—	0.01	—
Mg	—	—	—	—	—	—	3.68	3.87	3.83	3.59	—
Ca	—	0.02	0.03	2.01	2.07	2.04	—	1.93	1.99	—	1.03
Na	0.99	0.98	0.99	—	—	—	—	0.14	0.11	—	—
Total	5.00	4.99	5.01	8.01	8.04	8.01	10.02	15.16	15.17	10.02	3.02

* All Fe as FeO.

** All Fe as Fe₂O₃.**Table S2.** Whole rock chemical composition (wt%) for the metabasite samples collected from outcrop NM-MGB002 and the basal conglomerate of the Hiwadatoge Formation (outcrop NM-MGB003; samples NM-HTFg099 and 100) quantified by XRF.

	Rock body sample		Gravel samples	
	NM-MGB002	NM-HTFg099	NM-HTFg100	
SiO ₂	48.42	49.16	49.26	
TiO ₂	0.83	0.78	0.87	
Al ₂ O ₃	17.76	23.01	21.84	
FeO*	7.75	5.63	6.40	
MnO	0.14	0.09	0.12	
MgO	9.83	4.56	5.18	
CaO	12.23	13.43	12.65	
Na ₂ O	1.84	2.36	2.62	
K ₂ O	0.08	0.10	0.32	
P ₂ O ₅	0.09	0.07	0.08	
Total	98.97	99.19	99.34	
H ₂ O ⁽⁺⁾	3.67	3.25	3.24	
H ₂ O ^(−)	0.30	0.28	0.42	

* All Fe as FeO.