

Table. Th-Pb ion-microprobe age results from monazite grains collected along the Dudh Kosi-Everest transect and the Garhwal Himalaya.

Sample ^a (monazite_spot)	Age, Ma ($\pm\sigma$)	ThO ₂ ⁺ /Th ⁺ ^b ($\pm\sigma$)	Standard ^c ThO ₂ ⁺ /Th ⁺ ($\pm\sigma$)	²⁰⁸ Pb (%) ^d ($\pm\sigma$)	²⁰⁸ Pb*/Th ⁺ ^e ($\pm\sigma$)
ET7			8.008 (0.326)		
1_1	22.0 (0.4)	7.206 (0.052)		87.7 (1.3)	1.090E-03 (2.071E-05)
1_2	21.5 (0.5)	6.743 (0.035)		91.1 (1.2)	1.066E-03 (2.340E-05)
2_1	21.2 (0.3)	7.053 (0.039)		96.5 (0.9)	1.047E-03 (1.693E-05)
2_2	18.2 (0.6)	6.781 (0.058)		87.9 (2.2)	8.998E-04 (2.780E-05)
3_1	17.1 (1.3)	6.302 (0.094)		79.9 (5.7)	8.472E-04 (6.566E-05)
4_1	19.5 (0.3)	7.333 (0.039)		93.5 (1.2)	9.640E-04 (1.634E-05)
4_2	21.4 (0.4)	6.650 (0.035)		96.9 (0.7)	1.059E-03 (1.984E-05)
5_1	20.5 (0.4)	8.272 (0.060)		90.9 (1.5)	1.013E-03 (1.959E-05)
	20.2 (0.6)^f	7.042 (0.055)		90.6 (2.4)	9.983E-04 (3.040E-05)
ET12			7.839 (0.282)		
1_1 ^g	14.5 (0.7)	5.971 (0.042)		75.3 (2.9)	7.185E-04 (3.462E-05)
2_1	14.4 (0.6)	6.182 (0.062)		77.9 (2.2)	7.116E-04 (2.826E-05)
2_2	14.9 (1.1)	8.462 (0.158)		77.1 (5.7)	7.369E-04 (5.604E-05)
3_1	25.3 (0.5)	7.243 (0.085)		93.3 (1.2)	1.255E-03 (2.450E-05)
3_2	24.6 (0.4)	7.941 (0.079)		94.8 (1.2)	1.217E-03 (2.143E-05)
4_1	23.3 (0.8)	6.343 (0.081)		83.1 (1.8)	1.151E-03 (3.961E-05)
4_2	25.3 (0.7)	6.180 (0.030)		89.5 (1.4)	1.253E-03 (3.651E-05)
5_1	24.4 (1.0)	6.517 (0.214)		95.7 (1.0)	1.207E-03 (5.071E-05)
	20.8 (0.8)	6.855 (0.110)		85.8 (2.6)	1.031E-03 (3.819E-05)
ET18b			9.261 (0.108)		
1_1	18.6 (0.7)	7.705 (0.044)		93.2 (1.1)	9.196E-04 (3.689E-05)
2_1	17.3 (0.9)	7.543 (0.054)		86.6 (2.7)	8.579E-04 (4.615E-05)
3_1	19.4 (0.8)	8.382 (0.109)		85.2 (2.7)	9.578E-04 (3.925E-05)
3_2	21.2 (1.1)	8.355 (0.210)		84.3 (3.5)	1.050E-03 (5.473E-05)
4_1	33.5 (1.2)	7.800 (0.034)		96.9 (0.9)	1.659E-03 (6.110E-05)
4_2	39.5 (0.8)	8.483 (0.043)		98.4 (0.6)	1.957E-03 (4.200E-05)
5_1	21.1 (0.9)	7.588 (0.036)		97.0 (0.8)	1.044E-03 (4.400E-05)
7_1	19.5 (0.9)	7.606 (0.053)		95.7 (1.4)	9.637E-04 (4.224E-05)
8_1	20.2 (0.6)	8.087 (0.037)		95.8 (1.2)	9.989E-04 (3.101E-05)
9_1	191.2 (2.2)	8.866 (0.047)		98.9 (0.2)	9.504E-03 (1.106E-04)
	19.6 (0.9)^h	7.895 (0.097)		91.1 (2.1)	9.703E-04 (4.261E-05)
ET19 ^h					
2_1	246 (6)	4.186 (0.016)	4.940 (0.556)	99.6 (0.1)	1.225E-02 (3.008E-04)
2_2	137 (4)	4.393 (0.016)		99.4 (0.1)	6.827E-03 (1.873E-04)
5_1	140 (3)	4.268 (0.018)		99.3 (0.2)	6.971E-03 (1.694E-04)
4_1 ^g	548 (17)	4.007 (0.018)		99.9 (0.04)	2.751E-02 (8.664E-04)
6_1	511 (21)	3.820 (0.020)		99.0 (0.1)	2.559E-02 (1.057E-03)
1_1 ^g	33.1 (0.5)	9.082 (0.030)	8.336 (0.518)	98.3 (0.4)	1.639E-03 (2.323E-05)
5_1	205 (3)	9.084 (0.039)		99.8 (0.1)	1.021E-02 (1.710E-04)
2_1	141 (2)	8.900 (0.035)		99.6 (0.1)	6.990E-03 (1.148E-04)
ET22			7.889 (0.417)		
9_1 ^g	28.1 (0.5)	7.250 (0.133)		97.7 (0.6)	1.390E-03 (2.552E-05)
9_2 ^g	27.8 (0.6)	7.155 (0.103)		96.2 (0.7)	1.375E-03 (3.021E-05)
9_3 ^g	27.1 (0.5)	7.032 (0.084)		97.3 (0.7)	1.343E-03 (2.568E-05)
7_1 ^g	19.4 (0.5)	7.493 (0.114)		94.4 (1.9)	9.608E-04 (2.436E-05)

6_1	26.4 (0.7)	6.494 (0.073)	91.0 (1.3)	1.306E-03 (3.397E-05)
8_1 ^g	23.0 (0.7)	5.899 (0.047)	92.6 (0.8)	1.137E-03 (3.591E-05)
	25.3 (0.6)	6.887 (0.096)	94.9 (1.1)	1.252E-03 (2.964E-05)
ET23b		5.318 (0.213)		
1_1	15.0 (0.2)	4.988 (0.018)	90.8 (1.2)	7.415E-04 (1.186E-05)
2_1	23.4 (0.2)	4.981 (0.018)	97.8 (0.5)	1.156E-03 (9.783E-06)
2_2	27.2 (0.3)	4.765 (0.017)	97.3 (0.5)	1.347E-03 (1.401E-05)
2_3	23.8 (0.3)	4.617 (0.017)	97.2 (0.5)	1.178E-03 (1.405E-05)
5_1	23.7 (0.7)	3.525 (0.010)	98.3 (0.3)	1.174E-03 (3.507E-05)
6_1	29.6 (1.3)	2.999 (0.010)	99.1 (0.1)	1.466E-03 (6.555E-05)
	25.7 (0.9)	3.714 (0.013)	98.2 (0.3)	1.273E-03 (4.368E-05)
ET25		5.223 (0.114)		
4_1 ^g	29.3 (1.6)	6.509 (0.080)	81.9 (3.1)	1.452E-03 (8.018E-05)
7_1 ^g	29.0 (0.5)	4.632 (0.012)	95.9 (0.6)	1.434E-03 (2.260E-05)
8_1 ^g	28.1 (0.7)	4.840 (0.016)	84.3 (1.7)	1.391E-03 (3.585E-05)
1_1	24.5 (0.5)	4.618 (0.020)	95.3 (0.9)	1.215E-03 (2.277E-05)
2_1	23.2 (0.7)	4.447 (0.021)	85.8 (1.6)	1.150E-03 (3.527E-05)
3_1	17.9 (0.4)	4.600 (0.018)	92.4 (1.3)	8.843E-04 (1.882E-05)
3_2	26.0 (0.3)	4.753 (0.017)	97.0 (0.6)	1.289E-03 (1.647E-05)
	25.4 (0.8)	4.914 (0.035)	90.4 (1.6)	1.259E-03 (3.894E-05)
ET26		8.988 (0.441)		
5_1 ^g	23.9 (0.4)	8.263 (0.088)	98.1 (0.6)	1.183E-03 (1.908E-05)
10_1 ^g	436 (8)	8.730 (0.129)	99.2 (0.3)	2.179E-02 (4.022E-04)
7_1 ^g	45.8 (2.8)	7.310 (0.117)	51.7 (2.6)	2.269E-03 (1.397E-04)
3_1	44.5 (0.9)	9.464 (0.096)	98.7 (0.6)	2.202E-03 (4.397E-05)
8_1	20.4 (0.6)	8.030 (0.108)	93.4 (1.4)	1.012E-03 (2.824E-05)
2_1	18.2 (0.4)	8.967 (0.056)	93.5 (1.5)	9.018E-04 (1.870E-05)
	20.8 (0.5)^h	8.420 (0.086)	95.0 (1.2)	1.032E-03 (2.244E-05)
ET33		6.020 (0.242)		
1_1 ^g	16.4 (2.2)	4.941 (0.224)	88.8 (2.4)	8.104E-04 (1.089E-04)
2_1	15.7 (0.7)	5.480 (0.033)	93.7 (0.8)	7.770E-04 (3.321E-05)
2_2	15.1 (0.3)	5.820 (0.031)	94.2 (0.9)	7.483E-04 (1.528E-05)
2_3	15.6 (1.0)	5.970 (0.219)	94.4 (1.0)	7.703E-04 (4.966E-05)
3b_1	14.7 (1.8)	5.555 (0.360)	91.0 (1.4)	7.299E-04 (9.139E-05)
3b_2	15.3 (1.3)	4.983 (0.035)	92.6 (1.0)	7.552E-04 (6.267E-05)
3a_1	14.4 (0.9)	5.259 (0.042)	83.6 (1.6)	7.116E-04 (4.296E-05)
4_1	15.1 (0.7)	5.421 (0.065)	94.2 (0.8)	7.460E-04 (3.584E-05)
4_2	15.7 (1.2)	5.111 (0.083)	94.4 (1.0)	7.749E-04 (5.770E-05)
5_1	17.1 (3.1)	5.225 (0.284)	88.0 (1.4)	8.441E-04 (1.513E-04)
	15.5 (1.5)	5.377 (0.180)	91.5 (1.3)	7.668E-04 (7.568E-05)
ET38		3.858 (0.212)		
1_1	901 (13)	3.749 (0.027)	99.8 (0.05)	4.557E-02 (6.490E-04)
1_2	1026 (28)	3.352 (0.032)	99.6 (0.08)	5.209E-02 (1.467E-03)
2_1	1646 (45)	3.308 (0.016)	99.9 (0.03)	8.483E-02 (2.419E-03)
3_1	1595 (37)	3.385 (0.021)	99.8 (0.04)	8.211E-02 (1.978E-03)
4_1	1648 (18)	3.879 (0.023)	99.9 (0.03)	8.469E-02 (9.922E-04)
4_2	1469 (38)	3.416 (0.035)	99.8 (0.05)	7.537E-02 (2.009E-03)
4_3	1566 (49)	3.267 (0.021)	99.7 (0.05)	8.058E-02 (2.618E-03)
	1407 (35)	3.479 (0.026)	99.8 (0.05)	7.221E-02 (1.860E-03)
ET52		5.516 (0.647)		

1_1 ^g	13.9 (0.5)	3.665 (0.036)		94.9 (1.6)	6.896E-04 (2.314E-05)
2_1	12.3 (0.3)	4.744 (0.039)		89.5 (2.0)	6.069E-04 (1.695E-05)
2_2	15.2 (0.4)	4.363(0.024)		92.0 (1.5)	7.505E-04 (1.901E-05)
3_1	14.6 (0.4)	5.518 (0.044)		83.6 (2.3)	7.209E-04 (2.151E-05)
3_2	15.0 (0.3)	5.162 (0.042)		91.4 (1.2)	7.408E-04 (1.348E-05)
5_1	14.8 (0.4)	5.830 (0.035)		89.7 (1.8)	7.304E-04 (1.746E-05)
6_1	16.0 (0.6)	5.450 (0.025)		83.8 (2.3)	7.908E-04 (2.775E-05)
	14.5 (0.4)	4.962 (0.036)		89.3 (1.9)	7.186E-04 (2.037E-05)
85H20g					
1_1	10.6 (0.5)	1.695 (0.004)	3.327 (0.173)	85.2 (2.3)	5.264E-04 (2.253E-05)
1_2	10.0 (0.7)	2.212 (0.009)		62.4 (3.8)	4.948E-04 (3.289E-05)
2_1 ^g	14.2 (1.1)	3.761 (0.061)		92.0 (6.7)	7.006E-04 (5.543E-05)
3_1 ^g	13.3 (1.7)	3.100 (0.046)		86.3 (10.2)	6.602E-04 (8.180E-05)
4_1	13.3 (0.6)	3.129 (0.016)	3.430 (0.171)	90.1 (2.8)	6.562E-04 (2.829E-05)
5_1	13.1 (1.1)	2.991 (0.025)		81.1 (5.8)	6.484E-04 (5.372E-05)
7_1	16.5 (1.8)	2.628 (0.018)		90.5 (3.8)	8.180E-04 (9.094E-05)
	13.0 (1.2)	2.788 (0.032)		83.9 (5.6)	6.435E-04 (5.771E-05)
GM74			6.311 (0.338)		
4a_1	5.83 (0.34)	8.222 (0.049)		79.5 (4.2)	2.887E-04 (1.680E-05)
4a_2	5.37 (0.51)	6.570 (0.044)		73.0 (6.7)	2.656E-04 (2.501E-05)
4b_1	6.08 (0.47)	6.771(0.041)		75.2 (5.6)	3.007E-04 (2.319E-05)
4b_2	6.08 (1.03)	5.348 (0.045)		50.0 (8.2)	3.008E-04 (5.075E-05)
3a_1	6.09 (0.32)	7.143 (0.031)		74.8 (3.7)	3.013E-04 (1.585E-05)
3b_1	5.70 (0.54)	6.843 (0.039)		58.9 (5.2)	2.820E-04 (2.692E-05)
	5.9 (0.6)	6.816 (0.042)		68.6 (5.8)	2.898E-04 (2.886E-05)

- The nomenclature indicates the grain and spot, respectively, of the analyzed monazite. ET= Everest transect sample; 85H20g = see Hubbard (1989) for pressure and temperature information for this sample; GM74 was collected by Metcalfe (1993). See Figure 2 for sample locations.
- Measured ratio in sample.
- Average ratio of multiple analyses of the standard grains (monazite 554; Harrison et al., 1995). Samples that have two entries (ET19, 85H20g) represent two days of analyses.
- Percent radiogenically derived ²⁰⁸Pb.
- Corrected sample ratio assuming ²⁰⁸Pb/²⁰⁴Pb=39.5±0.1 (Stacey and Kramers, 1975).
- Averages (±1σ) of numerical results for the sample listed above are seen in bold.
- Monazite inclusion in garnet.
- Calculations exclude some analyses. ET18b age summary excludes 9_1, 4_1, and 4_2. Summary for ET26 includes only the Miocene monazite ages. No attempt was made to average the numerical results for the ET19 monazites.