



Step	T (°C)	⁴⁰ Ar total	Err. ⁴⁰ Ar	⁴⁰ Ar*	³⁹ Ar	Err. ³⁹ Ar	% ³⁹ Ar	³⁹ Ar	Err. ³⁹ Ar	³⁷ Ar	Err. ³⁷ Ar	³⁶ Ar	Err. ³⁶ Ar	Age	Error age	Ca/K	Err. Ca/K	Cl/K	Err. Cl/K
1	705	3.55E-08	1.24E-11	1.17E-09	2.35E-10	3.49E-13	2.49	8.22E-11	9.70E-14	9.38E-12	1.17E-13	1.15E-10	2.50E-13	7.19	0.47	0.0773	0.0010	0.0437	0.00008
2	828	2.22E-08	8.19E-12	6.55E-09	1.26E-09	8.68E-13	13.31	2.91E-10	3.43E-13	8.83E-12	1.17E-13	5.23E-11	1.15E-13	7.55	0.04	0.0136	0.0002	0.0377	0.00003
3	897	6.63E-09	9.36E-13	4.96E-09	9.57E-10	6.28E-13	10.14	2.08E-10	2.32E-13	2.77E-12	1.15E-13	5.59E-12	1.61E-14	7.51	0.01	0.0056	0.0002	0.0363	0.00002
4	964	5.63E-09	7.49E-13	3.86E-09	7.44E-10	5.26E-13	7.88	1.59E-10	1.78E-13	2.22E-12	1.15E-13	5.91E-12	1.63E-14	7.53	0.01	0.0058	0.0003	0.0356	0.00003
5	994	4.54E-09	6.32E-13	2.67E-09	5.09E-10	4.23E-13	5.40	1.12E-10	1.26E-13	2.22E-12	1.15E-13	6.26E-12	1.74E-14	7.60	0.02	0.0085	0.0004	0.0367	0.00003
6	1028	4.02E-09	7.02E-13	2.69E-09	5.17E-10	4.25E-13	5.47	1.17E-10	1.32E-13	1.79E-12	1.15E-13	4.46E-12	1.37E-14	7.54	0.01	0.0067	0.0004	0.0378	0.00003
7	1084	8.80E-09	1.33E-12	6.78E-09	1.32E-09	8.00E-13	13.95	3.08E-10	3.41E-13	2.08E-12	1.15E-13	6.76E-12	1.80E-14	7.46	0.01	0.0031	0.0002	0.0394	0.00002
8	1116	1.21E-08	1.94E-12	9.67E-09	1.88E-09	1.11E-12	19.95	4.22E-10	4.75E-13	1.23E-12	1.15E-13	7.97E-12	2.16E-14	7.45	0.01	0.0013	0.0001	0.0377	0.00002
9	1199	1.97E-08	5.15E-12	9.93E-09	1.93E-09	1.16E-12	20.44	3.66E-10	4.11E-13	1.19E-12	1.15E-13	3.27E-11	7.36E-14	7.46	0.02	0.0012	0.0001	0.0311	0.00002
10	1288	4.69E-09	7.49E-13	4.91E-10	9.08E-11	3.07E-13	0.96	1.91E-11	2.69E-14	4.07E-13	1.15E-13	1.41E-11	3.32E-14	7.83	0.16	0.0087	0.0025	0.0302	0.00012

Ar background: 4.68E-14

7.02E-14

2.34E-14

2.47E-13

4.68E-14

Measured ⁴⁰Ar/³⁶Ar in air pipette = 323.31

Fig. S1. ³⁹Ar-⁴⁰Ar age spectrum of the biotite separate of the tephra layer LB-T11: the weighted average age considering isochemical steps (7,8,9) is 7.45±0.01 Ma; all uncertainties are shown as 2σ. ³⁹Ar-⁴⁰Ar step heating results of the LB-T11 biotite separate: all isotopes are in ml; ages are in Ma; all uncertainties are given as 1 s.d.