ANALYTICAL PROCEDURE

$^{40}Ar/^{39}Ar$ Dating

Samples were selected, prepared and analysed following procedures described in Rolland et al. (2008). Pure white mica and amphibole monograins and aggregates less than 1 mm were separated by careful hand-picking under a binocular microscope to avoid altered grains or inclusions. All the samples were irradiated for around 50 h in the nuclear reactor at McMaster University in Hamilton (Canada), in position 5c along with Hb3gr hornblende fluence monitor (1073.6 ± 5.30 Ma; Jourdan et al., 2006) The estimated errors of $^{40}Ar^*/^{39}Ar_K$ ratio range from ± 0.1 to ± 0.6 % (2 σ) in the volume where the samples were included. All the samples were analysed by single-grain CO_2 laser fusion analysis. Isotopic ratios were measured using a VG3600 mass spectrometer, working with a Daly detector system, in the University of Nice (Geoazur laboratory). The typical blank values measured at every three heating steps for extraction and purification of the laser system are in the range 4.2-8.75, 1.2-3.9 cc STP for masses 40 and 39, respectively. Mass discrimination for the mass spectrometer was monitored by regularly analysing one air pipette volume. Decay constants are those of Steiger & Jäger (1977).

HR SIMS U-Pb Rutile Dating

Rutile crystals from a heavy mineral concentrate (sample 514b) were embedded in epoxy together with rutile standard R10 (1090 Ma; Luvizotto et al., 2009) and crystal interiors exposed by polishing. Due to its weak conductivity, rutile can be sputtered at high primary beam currents (ca. 170 nA) and high spatial resolution (ca. 35 µm) using an O_2^+ primary ion beam at the HR-SIMS CAMECA ims1270 at the Department of Earth and Planetary Sciences of the University of California Los Angeles. U/Pb fractionation was corrected through a UO_2^+/U^+ vs Pb^+/U^+ relative sensitivity calibration using randomly oriented R10 crystal fragments. The calibration scatter was reduced by directing an oxygen jet onto the sputtered surface, similar to previously established procedures for baddeleyite (Schmitt et al., 2010). Crystal-orientation effects are absent within ~1 % relative age uncertainty based on replicate analysis of several rutile standards. Common Pb was corrected for by the ^{208}Pb correction method (e.g. Zack et al., 2011).

U concentrations in rutiles from sample 514b range between 0.2 and 5.9 ppm (Table DR2). This results in low radiogenic Pb* given the young age of 514b (30-97% $^{206}Pb^*$; 1-68% $^{207}Pb^*$). This has a significant impact on the common-Pb corrected ages. The ^{208}Pb correction is much more robust for rutile than the conventionally applied ^{204}Pb correction (Zack et al., 2011) and all $^{206}Pb^*/^{238}U$ ages for 514b have <13% uncertainty, even for U abundances <1 ppm. However, $^{207}Pb^*/^{235}U$ uncertainties typically increase to a level in excess of 20% for U abundances <1.5 ppm, and are hence are excluded from further consideration (8 out of 25 grains). As an alternative to the ^{208}Pb correction we have also evaluated a Tera-Wasserburg regression of all uncorrected data. This is independent of any assumptions on common Pb compositions. The analyses define a mixing line (mean square of weighted deviates; MSWD = 2.0) between common ^{207}Pb/^{206}Pb = 0.80±0.05 and a concordia intercept corresponding to an age of 174±7 Ma. This is equivalent to the ^{208}Pb-corrected age.

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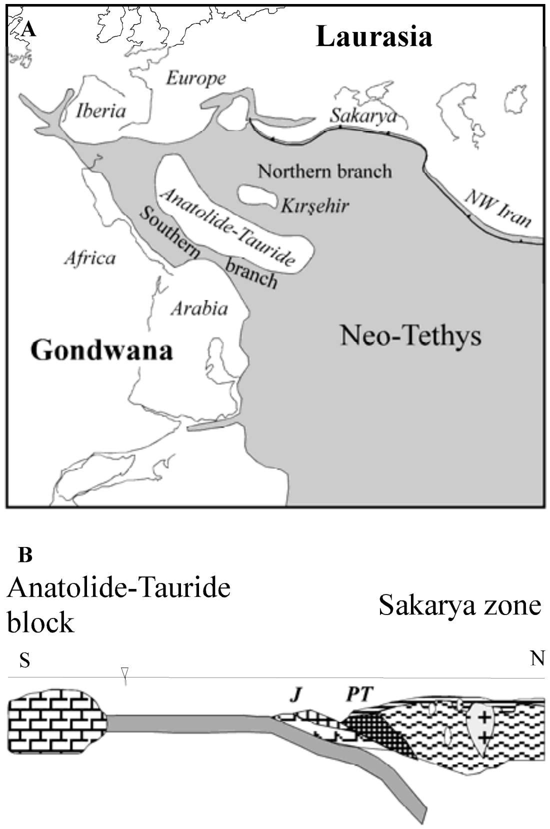

Figure DR1. (A). Paleogeographic reconstruction for the Early Jurassic time (modified after Barrier and Vrielynk, 2008). (B) Schematic cross-section from Anatolite-Tauride block to Sakarya zone for the Early to Middle Jurassic time. *PT* and *J* represent Permian-Triassic and Jurassic accretionary complexes, respectively.

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Table DR1. Ar-Ar isotopic data for phengite and hornblende samples from the Refahiye accretionary complex and ophiolite (NE Turkey)

87C Phengite (*J* = 0.00411610 ± 0.00004116)

T	36Ar	37Ar	38Ar	39Ar	%1s	40Ar	%1s	Age ± 2s (Ma)	40Ar(r) (%)	39Ar(k) (%)	K/Ca
400	0.0000371	0.0001968	0.0000322	0.0010970	1.459	0.0167849	0.631	38.14 ± 22.99	33.92	0.63	468
500	0.0000414	0.0000954	0.0000936	0.0060935	1.184	0.0972132	0.526	100.37 ± 4.47	87.12	3.49	5363
630	0.0000180	0.0000783	0.0002699	0.0226189	1.143	0.4273266	0.194	133.26 ± 3.17	98.58	12.94	24277
720	0.0000012	0.0003259	0.0003813	0.0323587	1.071	0.6687611	0.247	147.00 ± 3.15	99.80	18.52	8341
792	0.0000013	0.0003069	0.0004181	0.0334959	1.248	0.6973851	0.149	148.20 ± 3.63	99.91	19.17	9167
853	0.0000152	0.0001131	0.0003108	0.0242196	1.071	0.5276071	0.226	155.99 ± 3.30	100.72	13.86	17993
920	0.0000254	0.0002725	0.0001616	0.0143920	1.078	0.3244152	0.486	163.43 ± 3.81	102.20	8.24	4436
1030	0.0000278	0.0001305	0.0001666	0.0151765	1.359	0.3387940	0.749	162.10 ± 5.11	102.31	8.69	9769
1250	0.0000207	0.0002384	0.0001929	0.0169439	1.407	0.3906751	0.991	165.85 ± 5.76	101.46	9.70	5971
1500	0.0000095	0.0001933	0.0000967	0.0083451	1.114	0.1940081	0.280	166.99 ± 4.06	101.35	4.78	3626
Σ	0.0000022	0.0003467	0.0021239	0.1747412	0.431	3.6829704	0.150				

142 Phengite (*J* = 0.00411790 ± 0.00004118)

	36Ar	37Ar	38Ar	39Ar	%1s	40Ar	%1s	Age ± 2s (Ma)	40Ar(r) (%)	39Ar(k) (%)	K/Ca
436	0.0001621	0.0002084	0.0000976	0.0030302	1.191	0.1185195	0.270	164.05 ± 13.19	59.10	3.07	1221
499	0.0000882	0.0001638	0.0001977	0.0162217	1.076	0.4307790	0.217	176.11 ± 4.24	93.77	16.44	8319
499	0.0000377	0.0000875	0.0002017	0.0173737	1.080	0.4356890	0.210	172.72 ± 4.18	97.30	17.61	16679
600	0.0000205	0.0001545	0.0002557	0.0214449	1.101	0.5298057	0.148	172.66 ± 3.94	98.72	21.74	11657
633	0.0000066	0.0000585	0.0001422	0.0122002	1.058	0.2991134	0.133	174.41 ± 4.20	100.54	12.37	17508
700	0.0000091	0.0000319	0.0000926	0.0073965	1.042	0.1837207	0.168	173.01 ± 4.60	98.40	7.50	19469
1111	0.0000239	0.0001861	0.0002367	0.0209916	1.030	0.5123843	0.111	174.87 ± 3.68	101.27	21.28	9475
Σ	0.0002872	0.0004102	0.0012242	0.0986588	0.444	2.5100117	0.069				

96B Hornblende (*J* = 0.00411220 ± 0.00004112)

	36Ar	37Ar	38Ar	39Ar	%1s	40Ar	%1s	Age ± 2s (Ma)	40Ar(r) (%)	39Ar(k) (%)	K/Ca
450	0.0000728	0.0013746	0.0001479	0.0001800	4.303	0.0270883	0.906	213.28 ± 159.42	20.17	0.68	10.94
550	0.0000400	0.0016854	0.0001004	0.0002618	3.546	0.0152740	0.644	96.27 ± 68.09	22.74	0.99	12.99
650	0.0000191	0.0079531	0.0002427	0.0003734	2.121	0.0134528	0.266	162.29 ± 69.90	62.55	1.40	3.88
764	0.0000682	0.0764572	0.0089658	0.0041474	1.109	0.1139010	0.375	173.51 ± 6.91	88.19	15.58	4.50
810	0.0000393	0.0821973	0.0105895	0.0044875	1.059	0.1169056	0.302	179.54 ± 4.47	96.37	16.86	4.52
915	0.0000618	0.0981945	0.0131817	0.0056716	1.134	0.1461128	0.245	172.48 ± 4.85	93.50	21.32	4.79
1000	0.0000599	0.1040570	0.0134950	0.0056888	1.322	0.1490167	0.287	176.90 ± 5.87	94.37	21.37	4.53
1200	0.0000841	0.1040447	0.0138427	0.0057996	1.099	0.1555655	0.170	172.87 ± 5.82	89.98	21.79	4.62
Σ	0.0004452	0.4759639	0.0605657	0.0266101	0.510	0.7373168	0.118				

252 Hornblende (*J* = 0.00411310 ± 0.00004113)

	36Ar	37Ar	38Ar	39Ar	%1s	40Ar	%1s	Age ± 2s (Ma)	40Ar(r) (%)	39Ar(k) (%)	K/Ca
650	0.0001355	0.0067744	0.0003528	0.0009476	1.283	0.0505811	0.395	85.24 ± 36.13	21.92	2.03	11.69
760	0.0000251	0.0116569	0.0007680	0.0006869	1.498	0.0227073	0.351	170.03 ± 33.08	71.79	1.46	4.89
816	0.0000251	0.0179046	0.0015973	0.0009647	1.170	0.0271544	0.241	158.81 ± 13.16	78.40	2.05	4.46
860	0.0000156	0.0241492	0.0025032	0.0013402	1.193	0.0354839	0.243	176.28 ± 11.35	93.02	2.85	4.60
923	0.0000809	0.1342312	0.0147450	0.0073842	1.076	0.1898087	0.187	172.57 ± 4.42	93.69	15.69	4.56
1021	0.0000827	0.1342517	0.0145823	0.0074698	1.025	0.1955745	0.263	175.45 ± 4.71	93.60	15.87	4.61
1193	0.0001983	0.2851328	0.0313370	0.0159257	1.014	0.4147350	0.177	171.66 ± 4.21	91.98	33.84	4.63
1500	0.0001490	0.2242902	0.0239118	0.0123336	1.074	0.3222492	0.091	173.18 ± 4.70	92.51	26.21	4.56
Σ	0.0007121	0.8383910	0.0897976	0.0470528	0.505	1.2582941	0.082				

Table DR2. HR-SIMS U-Pb isotopic data and calculated ages for rutile grains from the mica schist 514B, Refahiye Metamorphics, NE Turkey

			uncorrected data										**common Pb corrected data**											
	U [ppm]	Th [ppb]	^{207}Pb/^{235}U [ratio]	1σ	^{206}Pb/^{238}U [ratio]	1σ	rho	^{207}Pb/^{206}Pb [ratio]	1σ	^{208}Pb/^{206}Pb [ratio]	1σ	^{207}Pb*/^{235}U [ratio]	1σ	^{206}Pb*/^{238}U [ratio]	1σ	rho	^{207}Pb*/^{206}Pb* [ratio]	1σ	^{207}Pb*/^{235}U [Ma]	1σ	^{206}Pb*/^{238}U [Ma]	1σ
g9	3.6	2.19	0.310	0.011	0.0265	0.0009	0.72	0.085	0.002	0.066	0.005	0.210	0.011	0.0256	0.0008	0.50	0.060	0.003	194	9	163	5
g26	5.4	31.99	0.368	0.021	0.0305	0.0012	0.73	0.088	0.004	0.104	0.007	0.194	0.014	0.0290	0.0012	0.57	0.049	0.003	180	12	184	7
g25	4.6	8.60	0.461	0.022	0.0292	0.0008	0.70	0.115	0.004	0.183	0.011	0.157	0.016	0.0266	0.0007	0.31	0.043	0.004	148	14	169	5
g22	4.2	5.67	0.339	0.020	0.0281	0.0009	0.53	0.088	0.004	0.081	0.006	0.210	0.017	0.0270	0.0008	0.40	0.056	0.004	194	14	172	5
g19	2.9	2.39	0.297	0.021	0.0284	0.0009	0.36	0.076	0.005	0.069	0.009	0.188	0.017	0.0274	0.0009	0.28	0.050	0.004	175	14	174	6
g17	5.9	5.12	0.533	0.024	0.0318	0.0010	0.74	0.122	0.004	0.201	0.010	0.171	0.019	0.0286	0.0009	0.30	0.043	0.004	160	16	182	6
g8	3.3	0.09	0.503	0.027	0.0298	0.0011	0.64	0.123	0.005	0.188	0.010	0.186	0.019	0.0270	0.0010	0.33	0.050	0.005	173	16	172	6
g1	4.2	0.20	0.804	0.030	0.0317	0.0009	0.69	0.184	0.005	0.347	0.010	0.194	0.023	0.0263	0.0008	0.22	0.054	0.006	180	19	167	5
g20	3.9	3.69	0.670	0.046	0.0296	0.0015	0.61	0.164	0.009	0.306	0.022	0.171	0.023	0.0252	0.0013	0.30	0.049	0.006	160	20	160	8
g24	3.8	12.13	0.540	0.028	0.0303	0.0012	0.55	0.129	0.006	0.204	0.012	0.187	0.024	0.0273	0.0011	0.22	0.050	0.006	174	20	174	7
g11	2.0	2.49	0.525	0.034	0.0318	0.0016	0.71	0.120	0.005	0.162	0.010	0.225	0.025	0.0292	0.0015	0.41	0.056	0.006	206	21	186	9
g15	3.7	2.35	0.516	0.029	0.0314	0.0012	0.79	0.119	0.004	0.168	0.013	0.216	0.027	0.0288	0.0011	0.35	0.054	0.006	198	23	183	7
g30	3.4	0.71	1.339	0.066	0.0380	0.0017	0.93	0.256	0.005	0.561	0.015	0.149	0.034	0.0275	0.0012	0.20	0.039	0.009	141	30	175	8
g12	1.6	2.95	0.758	0.043	0.0295	0.0011	0.71	0.186	0.007	0.358	0.018	0.167	0.037	0.0243	0.0010	0.17	0.050	0.011	157	32	155	6
g13	4.1	0.37	0.932	0.146	0.0363	0.0023	0.89	0.186	0.020	0.451	0.065	0.135	0.038	0.0282	0.0021	0.42	0.035	0.009	128	34	179	13
g14	4.6	5.91	2.122	0.094	0.0446	0.0013	0.68	0.345	0.011	0.778	0.029	0.192	0.039	0.0275	0.0010	0.12	0.051	0.010	178	33	175	6
g6	4.2	0.40	1.332	0.050	0.0376	0.0013	0.79	0.257	0.006	0.545	0.016	0.198	0.044	0.0275	0.0010	0.13	0.052	0.012	184	38	175	6
g5(§)	1.5	0.64	1.683	0.111	0.0430	0.0017	0.70	0.284	0.014	0.671	0.023			0.0288	0.0013						183	8
g4(§)	4.1	7.08	1.187	0.185	0.0426	0.0054	0.99	0.202	0.008	0.369	0.039			0.0349	0.0045						221	28
g23(§)	3.3	25.47	2.048	0.439	0.0492	0.0055	0.94	0.302	0.035	0.693	0.107			0.0325	0.0044						206	28
g29(§)	0.4	0.11	5.003	0.271	0.0695	0.0033	0.62	0.522	0.023	1.278	0.055			0.0258	0.0022						164	14
g28(§)	2.1	9.02	7.081	0.637	0.0877	0.0063	0.96	0.586	0.017	1.373	0.075			0.0285	0.0038						181	24
g27(§)	0.2	0.26	2.248	0.247	0.0421	0.0045	0.69	0.388	0.033	0.827	0.083			0.0250	0.0032						159	20
g10(§)	1.1	13.35	7.888	0.381	0.0947	0.0033	0.89	0.604	0.014	1.506	0.032			0.0246	0.0017						157	11
g7(§)	1.7	18.39	4.775	0.163	0.0670	0.0030	0.83	0.517	0.013	1.275	0.031			0.0251	0.0015						160	9

(§)- samples not considered for concordia plot due to too low radiogenic Pb or common-Pb-rich inclusion (encountered in samples g4 and g23)