

Supplementary Materials

Table S1: Whole-rock major (%) and trace elements (ppm) compositions of Baluogenguole mafic dykes in the ZTB

Samples	1-1	2-1	3-2	4-1	4-2	5-1	5-2	6-2	7-1	7-2	8-1	8-2
SiO <sub>2</sub>	49.9	50.7	50.9	47.3	49.4	50.5	50.2	51.0	49.4	48.7	51.8	51.3
TiO <sub>2</sub>	2.36	2.48	3.46	3.35	3.26	2.55	2.02	4.05	3.10	2.69	2.69	2.84
Al <sub>2</sub> O <sub>3</sub>	15.4	16.1	14.7	16.3	15.5	16.0	17.0	13.5	15.7	16.9	15.7	15.8
T <sub>Fe2O3</sub>	13.1	12.9	15.6	13.9	15.2	13.4	12.7	15.9	13.9	14.0	13.7	13.6
MnO	0.18	0.19	0.17	0.19	0.19	0.19	0.19	0.20	0.18	0.17	0.19	0.18
MgO	6.51	6.48	5.23	4.46	6.29	6.65	6.34	4.11	5.96	6.37	7.50	6.47
CaO	7.98	7.40	5.63	8.97	7.05	7.65	7.55	7.23	7.45	7.04	4.46	6.83
Na <sub>2</sub> O	3.52	2.81	3.75	3.92	2.63	2.26	3.16	3.40	3.80	3.73	3.42	2.54
K <sub>2</sub> O	0.87	0.61	0.14	1.10	0.21	0.40	0.58	0.08	0.19	0.24	0.30	0.21
P <sub>2</sub> O <sub>5</sub>	0.24	0.26	0.45	0.51	0.31	0.32	0.25	0.47	0.33	0.30	0.28	0.28
Y	19.83	21.35	30.61	28.86	25.89	26.28	23.16	37.06	28.29	23.85	22.99	27.97
La	9.84	10.78	19.39	36.68	19.37	19.53	14.14	29.04	21.34	17.52	11.54	20.15
Ce	22.36	24.29	42.56	72.00	40.77	41.02	30.53	63.58	43.79	36.88	28.11	43.58
Pr	3.04	3.25	5.45	8.55	5.04	5.08	3.84	8.16	5.40	4.59	3.62	5.43
Nd	13.63	14.31	23.55	32.69	20.84	20.92	16.18	34.34	22.23	18.88	16.31	22.70
Sm	3.71	3.97	6.10	6.82	5.10	5.12	4.18	8.34	5.50	4.67	4.49	5.65
Eu	1.34	1.19	2.33	2.05	1.65	1.65	1.43	2.67	1.77	1.57	1.53	1.84
Gd	3.87	4.20	6.32	6.64	5.26	5.32	4.48	8.35	5.63	4.81	4.63	5.78
Tb	0.64	0.68	1.01	0.95	0.83	0.84	0.73	1.27	0.90	0.76	0.76	0.91
Dy	3.70	3.98	5.74	5.27	4.82	4.89	4.31	7.05	5.12	4.39	4.39	5.22
Ho	0.74	0.79	1.13	1.05	0.96	0.97	0.86	1.38	1.03	0.88	0.87	1.04
Er	1.91	2.02	2.94	2.79	2.52	2.54	2.24	3.56	2.71	2.28	2.21	2.69
Tm	0.27	0.29	0.41	0.40	0.36	0.36	0.32	0.50	0.39	0.33	0.31	0.38
Yb	1.68	1.79	2.54	2.50	2.25	2.26	2.00	3.10	2.46	2.06	1.97	2.41
Lu	0.23	0.25	0.36	0.36	0.32	0.31	0.28	0.43	0.35	0.29	0.28	0.34
V	231.6	230.8	355.7	254.8	312.7	251.2	216.3	310.4	258.2	239.7	246.1	255.1
Cr	143.8	150.8	130.5	32.27	130.5	156.8	139.0	312.4	112.3	89.02	281.9	204.9
Co	44.10	35.30	44.91	35.86	40.27	40.82	39.09	46.95	38.90	34.41	44.22	40.44

Ni	88.99	86.70	71.84	31.48	82.39	89.45	83.99	150.2	72.88	70.51	153.0	116.4
Ga	17.88	17.82	21.44	19.99	20.77	19.67	18.56	22.65	20.87	18.99	17.82	19.99
Rb	34.73	21.22	5.15	26.54	8.04	17.40	16.40	2.01	6.98	9.00	11.57	3.56
Sr	178.6	223.3	344.7	304.5	340.7	728.0	395.0	419.9	406.6	423.2	184.8	430.0
Zr	100.4	104.6	158.0	216.3	143.8	147.8	115.1	244.1	157.0	131.8	127.5	164.3
Nb	13.49	14.36	24.59	50.65	26.30	27.81	19.82	31.92	28.98	23.41	17.26	26.65
Mo	0.55	0.48	0.93	1.13	0.90	0.63	0.87	2.47	0.67	0.45	1.63	1.36
In	0.07	0.07	0.09	0.08	0.08	0.08	0.07	0.10	0.08	0.07	0.07	0.08
Cs	2.00	1.56	0.82	1.79	0.73	1.54	1.22	0.33	0.73	0.87	1.09	0.61
Ba	115.7	78.2	227.7	229.4	265.9	215.4	174.4	73.62	126.7	186.0	60.4	129.3
Hf	2.41	2.55	3.81	4.79	3.48	3.54	2.88	5.73	3.75	3.17	3.12	3.96
Ta	0.76	0.79	1.35	2.72	1.45	1.51	1.08	1.84	1.63	1.33	1.00	1.52
W	0.19	0.88	0.35	0.60	0.35	0.38	0.43	0.68	0.37	0.29	0.45	0.41
Tl	0.15	0.09	0.03	0.12	0.04	0.08	0.07	0.01	0.03	0.04	0.05	0.02
Pb	6.65	4.77	12.16	3.01	6.51	4.01	3.11	9.08	7.94	7.97	11.99	8.96
Th	1.10	1.21	2.48	5.12	2.52	2.39	1.75	4.37	2.74	2.25	1.40	2.71
U	0.60	1.06	0.62	1.25	0.59	0.57	0.41	0.99	0.63	0.55	0.69	0.60
ΣREE	66.95	71.80	119.8	178.8	110.1	110.8	85.53	171.8	118.6	99.91	81.03	88.98
LREE	53.92	57.81	99.38	158.8	92.78	93.33	70.31	146.1	100.0	84.11	65.61	72.72
HREE	13.03	13.99	20.44	19.97	17.32	17.51	15.22	25.63	18.58	15.80	15.42	16.26
LREE/HREE	4.14	4.13	4.86	7.95	5.36	5.33	4.62	5.70	5.39	5.33	4.26	4.47
La <sub>N</sub> /Yb <sub>N</sub>	4.21	4.32	5.48	10.51	6.17	6.20	5.08	6.72	6.22	6.10	4.21	4.76
δEu	1.08	0.89	1.15	0.93	0.98	0.97	1.01	0.98	0.97	1.02	1.02	1.03
δCe	1.00	1.01	1.02	1.00	1.01	1.01	1.02	1.01	1.00	1.01	1.07	1.01

Note: TFeO (wt.%) = FeO(wt.%) + 0.8998\*Fe<sub>2</sub>O<sub>3</sub>(wt.%); Mg#=100\*MgO(wt.+)/40/(MgO(wt.+)/40+TFeO(wt.+)/72);

A/CNK=Al<sub>2</sub>O<sub>3</sub>/(CaO+Na<sub>2</sub>O+K<sub>2</sub>O);A/NK=Al<sub>2</sub>O<sub>3</sub>/(Na<sub>2</sub>O+K<sub>2</sub>O).

Table S2: LA-ICM-MS zircon U–Pb data of Baluogenguole mafic dykes in the ZTB

No	ppm		Th/U	Isotope ratios						Isotopic ages (Ma)						Concordance
	Th	U		$^{207}\text{Pb}/^{235}\text{U}$	2 $\sigma$	$^{206}\text{Pb}/^{238}\text{U}$	2 $\sigma$	$^{207}\text{Pb}/^{206}\text{Pb}$	2 $\sigma$	$^{207}\text{Pb}/^{235}\text{U}$	2 $\sigma$	$^{206}\text{Pb}/^{238}\text{U}$	2 $\sigma$	$^{207}\text{Pb}/^{206}\text{Pb}$	2 $\sigma$	
1	76	123	0.6	0.3310	0.0220	0.0463	0.0008	0.0508	0.0031	288	16.0	292	4.7	220	130.0	99
2	369	322	1.2	0.3330	0.0170	0.0454	0.0009	0.0539	0.0026	291	13.0	287	5.7	330	110.0	98
3	327	298	1.1	0.3300	0.0140	0.0460	0.0008	0.0527	0.0023	288	11.0	290	4.7	277	93.0	99
4	101	134	0.8	0.3350	0.0160	0.0460	0.0006	0.0529	0.0024	291	12.0	290	3.9	260	99.0	100
8	148	193	0.8	0.3220	0.0210	0.0456	0.0009	0.0511	0.0035	282	17.0	287	5.7	200	140.0	95
9	158	186	0.9	0.3420	0.0200	0.0459	0.0007	0.0540	0.0031	297	15.0	289	4.4	310	120.0	87
10	524	435	1.2	0.3090	0.0170	0.0438	0.0008	0.0520	0.0028	272	13.0	277	4.9	260	120.0	89
11	196	259	0.8	0.3430	0.0200	0.0454	0.0007	0.0547	0.0033	298	15.0	286	4.6	340	130.0	98
12	268	265	1.0	0.3280	0.0250	0.0463	0.0010	0.0513	0.0037	287	19.0	292	6.2	210	160.0	97
13	69	111	0.6	0.3190	0.0190	0.0457	0.0008	0.0507	0.0030	279	14.0	288	5.0	190	130.0	98
15	139	170	0.8	0.3320	0.0150	0.0460	0.0006	0.0525	0.0023	289	11.0	290	3.7	252	94.0	96
16	155	320	0.5	0.5380	0.0140	0.0697	0.0008	0.0562	0.0014	436	9.2	434	4.8	437	56.0	98
17	123	163	0.8	0.3370	0.0220	0.0465	0.0009	0.0526	0.0034	293	17.0	293	5.7	270	140.0	97
18	78	110	0.7	0.3270	0.0200	0.0459	0.0008	0.0517	0.0032	285	15.0	289	4.7	210	130.0	95
21	136	203	0.7	0.3370	0.0140	0.0460	0.0006	0.0536	0.0023	294	11.0	290	3.6	297	90.0	100
22	116	273	0.4	0.5370	0.0150	0.0708	0.0008	0.0554	0.0016	435	10.0	441	4.9	398	62.0	100
23	111	174	0.6	0.3300	0.0150	0.0459	0.0006	0.0523	0.0023	288	12.0	289	3.9	250	95.0	100
24	118	188	0.6	0.3400	0.0220	0.0453	0.0009	0.0546	0.0035	295	17.0	285	5.6	370	140.0	99
25	99	187	0.5	0.5420	0.0170	0.0710	0.0009	0.0559	0.0017	438	12.0	442	5.2	420	67.0	93

Table S3: Whole-rock Sr-Nd isotopic compositions of the Baluogenguole mafic dykes in the ZTB											
No	Age(Ma)	<sup>85</sup> Rb/ <sup>86</sup> Sr	<sup>87</sup> Sr/ <sup>86</sup> Sr	1SE	( <sup>87</sup> Sr/ <sup>86</sup> Sr) <sub>i</sub>	<sup>147</sup> Sm/ <sup>144</sup> Nd	<sup>143</sup> Nd/ <sup>144</sup> Nd	1SE	( <sup>143</sup> Nd/ <sup>144</sup> Nd) <sub>i</sub>	εNd(t)	TDM (Ma)
4-1	289.3	0.0002	0.717526	0.000004	0.71753	0.0024	0.512530	0.000004	0.512525	5.07	449
7-1		0.0005	0.715876	0.000007	0.71587	0.0005	0.512645	0.000006	0.512644	7.39	362
8-1		0.0237	0.722608	0.000006	0.72251	0.0065	0.512699	0.000006	0.512687	8.23	333

Table S4: LA-ICM-MS zircon Lu-Hf isotopic data of Baluogenguole mafic dykes in the ZTB										
spot	Age (Ma)	<sup>176</sup> Yb/ <sup>177</sup> Hf	<sup>176</sup> Lu/ <sup>177</sup> Hf	2σ	<sup>176</sup> Hf/ <sup>177</sup> Hf	2σ	εHf(t)	f <sub>Lu/Hf</sub>	TDM	
B-04_01	292	0.032016	0.000855	0.000017	0.282681	0.000018	3.03	-0.97	806	
B-04_05	290	0.043861	0.001146	0.000028	0.282679	0.000017	2.87	-0.97	815	
B-04_07	285	0.021141	0.000556	0.000006	0.282654	0.000018	1.99	-0.98	837	
B-04_12	292	0.100491	0.002578	0.000007	0.282688	0.000022	2.95	-0.92	834	
B-04_14	290	0.037269	0.000950	0.000029	0.282698	0.000020	3.58	-0.97	783	
B-04_18	289	0.027367	0.000761	0.000010	0.282658	0.000021	2.18	-0.98	836	
B-04_21	289	0.055073	0.001402	0.000026	0.282658	0.000019	2.04	-0.96	851	
B-04_24	290	0.052202	0.001323	0.000017	0.282659	0.000018	2.13	-0.96	846	