Table 1. Representative analysis (wt%) of olivine from the Sivarampeta dykes.

Oxide wt%	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***9***	***10***
SiO2	40.24	40.19	40.26	40.53	40.50	39.97	40.16	40.42	40.45	40.76
TiO2	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Al2O3	0.07	0.14	0.07	0.06	0.06	0.08	0.06	0.06	0.06	0.10
Cr2O3	0.04	0.05	0.04	0.05	0.04	0.04	0.04	0.04	0.04	0.04
FeO	13.88	13.83	13.84	13.94	13.99	13.74	13.89	14.01	14.04	13.37
MnO	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.19
MgO	44.60	44.39	44.35	44.86	44.70	43.92	44.30	44.58	44.56	44.32
NiO	0.31	0.31	0.31	0.31	0.30	0.30	0.30	0.30	0.30	0.29
CaO	0.22	0.22	0.21	0.22	0.22	0.23	0.22	0.22	0.22	0.21
Total	99.57	99.34	99.31	100.17	100.03	98.48	99.18	99.85	99.88	99.30
Cations based on 4 oxygen										
Si	1.011	1.012	1.014	1.012	1.013	1.015	1.013	1.013	1.013	1.023
Ti	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Al	0.002	0.004	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003
Cr	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Fe(ii)	0.292	0.291	0.291	0.291	0.293	0.292	0.293	0.294	0.294	0.280
Mn	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
Mg	1.671	1.666	1.665	1.670	1.667	1.663	1.666	1.666	1.664	1.658
Ni	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006
Ca	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006
TOTAL	2.993	2.991	2.990	2.992	2.991	2.989	2.991	2.991	2.991	2.981
Endmembers										
Fo	84.97	84.95	84.94	84.99	84.90	84.91	84.87	84.85	84.81	85.35
Fa	14.83	14.85	14.87	14.82	14.90	14.89	14.93	14.96	14.99	14.44
Tp	0.20	0.20	0.19	0.19	0.19	0.19	0.20	0.20	0.20	0.20

Table 2. Representative analysis (wt%) of pyroxenes from the Sivarampeta dykes.

Oxide wt%	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***9***	***10***
SiO2	52.21	51.80	51.64	51.98	51.85	52.39	51.23	50.85	50.94	51.43
TiO2	0.67	0.73	0.76	0.72	0.66	0.63	0.79	1.18	1.17	0.89
Al2O3	4.39	4.58	5.10	4.71	4.91	4.45	5.00	5.80	5.81	4.86
Cr2O3	0.24	0.21	0.16	0.26	0.21	0.17	0.25	0.10	0.14	0.05
Fe2O3	0.16	0.22	0.09	0.12	0.00	0.00	1.20	0.29	0.00	0.42
FeO	4.30	4.70	5.06	5.10	5.40	4.74	3.36	5.66	5.85	5.61
MnO	0.07	0.00	0.06	0.01	0.06	0.09	0.14	0.00	0.05	0.00
MgO	16.96	16.40	16.31	16.33	16.33	16.30	16.65	15.63	15.26	16.03
CaO	19.42	19.77	19.18	19.64	19.12	19.85	19.83	19.39	19.34	19.19
Na2O	0.75	0.72	0.79	0.73	0.76	0.74	0.73	0.76	0.79	0.76
K2O	0.02	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Total	99.20	99.13	99.15	99.61	99.30	99.35	99.17	99.65	99.36	99.25
Cations for 6 oxygen atoms										
Si	1.909	1.901	1.894	1.900	1.900	1.915	1.881	1.865	1.872	1.892
Al(IV)	0.091	0.099	0.106	0.100	0.100	0.085	0.119	0.135	0.128	0.108
Al(VI)	0.098	0.099	0.114	0.103	0.112	0.107	0.098	0.116	0.124	0.103
Fe(iii)	0.004	0.006	0.003	0.003	0.000	0.000	0.033	0.008	0.000	0.012
Cr	0.007	0.006	0.004	0.008	0.006	0.005	0.007	0.003	0.004	0.001
Ti	0.018	0.020	0.021	0.020	0.018	0.017	0.022	0.032	0.032	0.025
Fe(ii)	0.132	0.144	0.155	0.156	0.166	0.145	0.103	0.173	0.180	0.172
Mn	0.002	0.000	0.002	0.000	0.002	0.003	0.004	0.000	0.002	0.000
Mg	0.924	0.898	0.892	0.890	0.892	0.888	0.912	0.854	0.836	0.879
Ca	0.761	0.777	0.754	0.769	0.751	0.777	0.780	0.762	0.762	0.757
Na	0.053	0.051	0.056	0.052	0.054	0.052	0.052	0.054	0.056	0.054
K	0.001	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000
Total	4.001	4.002	4.001	4.001	4.000	3.995	4.011	4.003	3.996	4.004
End members										
Wo	40.53	41.43	40.49	41.12	40.28	41.67	41.41	41.15	41.50	40.37
En	49.25	47.84	47.92	47.58	47.86	47.62	48.39	46.15	45.54	46.91
Fs	7.37	8.00	8.58	8.53	8.98	7.92	7.44	9.80	9.90	9.82
Ac	2.85	2.73	3.01	2.77	2.88	2.80	2.76	2.90	3.06	2.90

Table 3. Representative analysis (wt%) of micas from the Sivarampeta dykes.

Oxide wt%	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***9***	***10***
SiO2	35.29	35.70	34.47	36.20	35.29	39.89	38.96	35.56	35.12	35.55
TiO2	7.78	6.35	8.72	2.24	8.67	1.63	1.63	1.80	2.53	2.19
Al2O3	13.87	14.19	13.93	14.80	12.95	10.49	12.03	15.10	14.94	14.43
Cr2O3	0.14	0.13	0.16	0.19	0.08	0.22	0.10	0.09	0.13	0.12
FeO	16.66	18.09	16.77	16.32	14.35	17.87	12.82	18.78	19.00	18.67
MnO	0.18	0.10	0.15	0.19	0.16	0.08	0.18	0.25	0.07	0.08
MgO	9.37	9.51	10.51	13.65	11.52	13.12	12.61	12.03	10.91	11.72
CaO	3.12	1.30	0.22	0.69	1.42	1.62	7.24	0.00	0.00	0.00
BaO	0.31	0.75	0.83	0.24	0.67	0.06	0.11	0.07	0.37	0.00
Na2O	0.06	0.06	0.42	0.04	0.45	0.04	0.17	0.07	0.07	0.03
K2O	7.76	8.33	8.22	8.71	7.61	7.63	6.35	8.64	8.60	8.94
Cl	0.08	0.06	0.07	0.16	0.06	0.44	0.09	0.22	0.28	0.14
F	0.23	0.14	0.07	0.03	0.26	0.18	0.26	0.06	0.10	0.24
Total	94.84	94.71	94.54	93.45	93.49	93.28	92.53	92.66	92.13	92.11
Cations for 22 oxygen atoms										
Si	5.409	5.503	5.305	5.575	5.428	6.152	5.973	5.577	5.568	5.625
Ti	0.897	0.737	1.010	0.259	1.003	0.189	0.187	0.212	0.302	0.260
Al	2.504	2.579	2.526	2.686	2.347	1.907	2.173	2.791	2.791	2.690
Cr	0.016	0.016	0.020	0.023	0.010	0.026	0.012	0.011	0.017	0.015
Fe(ii)	2.135	2.332	2.158	2.101	1.846	2.305	1.643	2.464	2.519	2.470
Mn	0.023	0.013	0.020	0.025	0.020	0.011	0.023	0.033	0.009	0.011
Mg	2.140	2.187	2.410	3.133	2.640	3.015	2.882	2.813	2.579	2.765
Ca	0.512	0.215	0.036	0.114	0.234	0.268	1.189	0.000	0.000	0.000
Ba	0.018	0.045	0.050	0.015	0.041	0.004	0.007	0.004	0.023	0.000
Na	0.018	0.019	0.125	0.012	0.135	0.012	0.050	0.021	0.021	0.010
K	1.517	1.638	1.613	1.710	1.493	1.500	1.242	1.729	1.738	1.804
Cl	0.021	0.015	0.018	0.043	0.016	0.115	0.022	0.058	0.076	0.038
F	0.110	0.069	0.032	0.013	0.128	0.087	0.127	0.030	0.049	0.122
Total	15.191	15.283	15.273	15.651	15.197	15.390	15.382	15.656	15.567	15.651
Mg#	0.50	0.48	0.53	0.60	0.59	0.57	0.64	0.53	0.51	0.53

Table 4. Representative analysis (wt%) of feldspar from the Sivarampeta dykes.

Oxide wt%	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***9***	***10***
SiO2	63.55	66.25	66.03	64.55	66.74	67.84	65.42	66.69	67.17	68.19
Al2O3	19.88	19.83	18.90	18.99	19.20	19.52	19.17	19.55	19.41	17.60
FeO	0.24	0.18	0.18	0.05	0.21	0.11	0.03	0.04	0.04	0.03
CaO	3.02	1.11	0.32	1.32	1.10	0.35	0.33	0.85	1.10	0.00
Na2O	4.38	7.01	4.95	6.32	8.29	11.44	5.65	10.99	10.49	0.56
K2O	8.28	5.71	10.46	7.63	4.15	0.02	7.21	0.04	1.35	14.16
BaO	1.01	0.00	0.00	0.22	0.19	0.00	1.34	0.00	0.00	0.12
Total	100.36	100.09	100.85	99.08	99.89	99.28	99.14	98.17	99.56	100.65
Cations for 32 oxygen atoms										
Si	11.580	11.822	11.908	11.789	11.895	11.944	11.915	11.884	11.882	12.319
Al	4.269	4.170	4.017	4.087	4.034	4.050	4.114	4.106	4.046	3.747
Fe(ii)	0.037	0.027	0.027	0.008	0.031	0.016	0.004	0.006	0.006	0.004
Ca	0.590	0.212	0.062	0.258	0.211	0.066	0.064	0.163	0.209	0.000
Na	1.549	2.425	1.731	2.239	2.863	3.904	1.994	3.798	3.599	0.197
K	1.924	1.299	2.406	1.778	0.944	0.004	1.675	0.009	0.305	3.263
Ba	0.072	0.000	0.000	0.016	0.013	0.000	0.096	0.000	0.000	0.008
Total	20.022	19.955	20.152	20.176	19.991	19.985	19.862	19.967	20.047	19.538
End members										
An	14.52	5.38	1.48	6.03	5.25	1.66	1.72	4.11	5.09	0.00
Ab	38.12	61.61	41.22	52.38	71.25	98.23	53.42	95.66	87.49	5.69
Or	47.36	33.00	57.30	41.59	23.50	0.11	44.87	0.24	7.42	94.31

Table 5. Representative analysis (wt%) of Ilmenite from the Sivarampeta dykes.

Oxide wt%	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
SiO2	0.02	0.16	0.17	0.45	0.00	0.00	0.00	0.00	0.00	0.00
TiO2	51.20	51.24	51.61	50.74	50.28	51.81	50.97	51.51	51.42	51.64
Al2O3	0.08	0.08	0.19	0.19	0.10	0.07	0.07	0.06	0.07	0.07
Cr2O3	0.14	0.20	0.20	0.17	0.16	0.16	0.16	0.18	0.16	0.16
V2O3	0.40	0.47	0.73	0.44	0.52	0.48	0.57	0.49	0.43	0.67
Fe2O3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FeO	45.55	44.76	44.59	44.56	44.28	44.09	44.83	44.44	44.40	43.89
MnO	2.47	1.58	1.41	2.78	3.42	2.36	2.29	2.31	2.64	2.44
MgO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CaO	0.32	0.64	0.92	0.29	0.71	0.23	0.21	0.22	0.12	0.20
ZnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	100.17	99.12	99.80	99.62	99.47	99.20	99.11	99.21	99.25	99.06
Cations for 32 oxygen atoms										
Si	0.006	0.048	0.050	0.137	0.000	0.000	0.000	0.000	0.000	0.000
Ti	11.616	11.743	11.732	11.557	11.465	11.888	11.696	11.815	11.791	11.865
Al	0.029	0.028	0.067	0.066	0.037	0.027	0.027	0.022	0.026	0.025
Cr	0.033	0.049	0.047	0.040	0.037	0.039	0.039	0.043	0.039	0.040
V	0.096	0.114	0.177	0.106	0.126	0.117	0.140	0.120	0.104	0.163
Fe(iii)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Fe(ii)	11.488	11.404	11.269	11.286	11.226	11.246	11.438	11.330	11.319	11.212
Mn	0.630	0.407	0.360	0.714	0.879	0.609	0.592	0.597	0.681	0.631
Mg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ca	0.103	0.207	0.298	0.094	0.229	0.075	0.069	0.073	0.041	0.065
Zn	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	24	24	24	24	24	24	24	24	24	24

Table 6. Representative analysis (wt%) of secondary amphiboles from the Sivarampeta dyke.

Oxide wt%	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
SiO_2	54.36	54.32	53.78	55.19	55.06	54.28	54.64	54.31	54.29	54.43
TiO_2	0.36	0.98	0.04	0.06	0.10	0.00	0.09	0.59	0.30	0.20
Al_2O_3	0.65	7.90	1.97	1.27	0.62	1.88	0.29	0.59	0.67	1.04
Cr_2O_3	0.10	0.11	0.07	0.08	0.17	0.11	0.51	0.09	0.24	0.28
Fe_2O_3	5.53	0.00	3.16	4.36	0.41	3.55	0.65	3.60	2.62	5.19
FeO	8.89	6.53	6.41	5.89	6.91	5.30	8.68	6.64	6.37	6.26
MnO	0.23	0.12	0.27	0.22	0.23	0.22	0.14	0.10	0.31	0.10
MgO	15.46	13.74	17.41	17.95	18.50	17.99	17.60	18.62	18.26	17.71
CaO	11.26	12.01	12.11	11.93	12.40	11.95	12.65	13.05	12.54	12.36
Na_2O	0.21	1.63	0.12	0.23	0.09	0.16	0.00	0.00	0.00	0.00
K_2O	0.11	0.82	0.05	0.10	0.07	0.07	0.01	0.03	0.02	0.00
ZrO_2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	97.16	98.17	95.38	97.28	94.57	95.49	95.25	97.63	95.60	97.57
Cations for 23 oxygen atoms										
Si	7.825	7.561	7.759	7.803	7.964	7.781	7.932	7.704	7.819	7.721
Ti	0.039	0.103	0.004	0.006	0.011	0.000	0.010	0.063	0.032	0.022
Al	0.111	1.297	0.336	0.211	0.106	0.317	0.050	0.099	0.113	0.173
Cr	0.011	0.012	0.008	0.009	0.019	0.013	0.058	0.010	0.027	0.031
Fe(iii)	0.599	0.000	0.343	0.464	0.045	0.383	0.071	0.384	0.284	0.554
Fe(ii)	1.070	0.760	0.773	0.697	0.836	0.635	1.053	0.788	0.767	0.743
Mn	0.028	0.014	0.033	0.026	0.029	0.027	0.017	0.012	0.038	0.012
Mg	3.318	2.852	3.744	3.783	3.990	3.845	3.810	3.938	3.920	3.744
Ca	1.737	1.791	1.872	1.807	1.921	1.835	1.968	1.983	1.935	1.878
Na	0.059	0.440	0.033	0.064	0.024	0.043	0.000	0.000	0.000	0.000
K	0.020	0.146	0.009	0.018	0.013	0.012	0.002	0.005	0.003	0.001
Zr	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	14.816	14.975	14.914	14.889	14.959	14.890	14.970	14.988	14.938	14.879

Table 7. Bulk rock geochemistry data for the Sivarampeta lamprophyre (SPL) samples of this study. C.I.P.W. norms were calculated by using the computer programme SINCLAS (Verma et al., 2002)

Major oxides	*S1/1*	*S1/2*	*S1/3*	*S1/4*
SiO2	47.21	47.97	47.31	47.91
TiO2	2.55	2.47	2.33	2.31
Al2O3	14.24	14.57	13.26	13.36
Fe2O3(T)	10.44	10.49	10.32	10.34
MnO	0.14	0.15	0.16	0.14
MgO	6.14	7.27	8.20	8.11
CaO	7.65	8.27	9.02	8.96
Na2O	3.48	3.05	2.92	3.11
K2O	3.43	3.13	3.03	2.89
P_2O_5	0.58	0.53	0.49	0.48
LOI	3.16	2.29	2.58	2.68
Total	99.77	99.51	99.03	99.78
Norms				
Or	20.27	18.50	17.91	17.08
Ab	15.90	16.66	12.93	14.94
An	13.10	16.82	14.12	13.96
Ne	7.34	4.96	6.38	6.16
Di	17.36	17.01	22.40	22.36
Ol	14.58	16.90	16.63	16.50
Il	4.83	4.69	4.42	4.39
Ap	1.34	1.23	1.14	1.11
Mg#	54.09	58.13	61.42	61.11
Trace elements (ppm)				
Sc	14	18	19	19
Be	2	1	1	1
V	135	156	165	159
Cr	150	190	260	190
Co	45	41	44	44
Ni	210	170	230	190
Cu	80	60	70	70
Zn	130	110	160	110
Ga	19	18	17	17
Ge	1	1	1	1
As	5	5	5	5
Rb	109	104	81	81
Sr	723	854	752	752
Y	21	20	18	20
Zr	258	253	221	219
Nb	47	46	36	38
Mo	2	2	2	2
Ag	1.5	0.5	1.2	1.1
In	0.2	0.2	0.2	0.2
Sn	2	3	2	2
Sb	0.5	0.5	0.5	0.5
Cs	2	1.6	1.2	1.3
Ba	1024	817	758	765
La	70.2	56.5	54.1	54
Ce	143	116	114	114
Pr	15.5	14	12.9	12.7
Nd	57.2	50.6	48.7	48.1
Sm	9.1	8.9	8	8.1
Eu	2.72	2.39	2.42	2.44
Gd	6.7	6.1	6.3	6.2
Tb	0.9	0.9	0.8	0.8
Dy	4.8	4.8	4.5	4.4
Ho	0.8	0.8	0.8	0.8
Er	2.2	2.1	2.1	2
Tm	0.28	0.27	0.27	0.26
Yb	1.7	1.7	1.5	1.5
Lu	0.25	0.25	0.23	0.23
Hf	4.9	5.2	4.5	4.3
Ta	2.8	2.6	2.3	2.3
W	1	1	1	1
Tl	0.3	0.3	0.2	0.2
Pb	12	7	30	7
Bi	0.4	0.4	0.4	0.4
Th	3.1	2.8	2.5	2.6
U	0.7	0.6	0.6	0.5

Verma, S.P., Torres-Alvarado, I.S. and Sotelo-Rodríguez, Z.T. (2002) SINCLAS: standard igneous norm and volcanic rock classification system. Computers & Geosciences, 28, 711–715.

Table 8. Sm-Nd and Rb-Sr isotope geochemistry data for the Sivarampeta lamprophyres (SPL).

Sm-Nd compositions							
Samples	Sm (ppm)	Nd (ppm)	$^{147}Sm/^{144}Nd$	$^{143}Nd/^{144}Nd$	$^{143}Nd/^{144}Ndiniti$	εNdinitial	T_{DM} in Ga
S1/2	8.9	50.6	0.1063	0.511011	0.510244	-19.1	2.75
S1/3	8	48.7	0.0993	0.510695	0.509978	-24.2	2.98

Rb-Sr compositions					
Samples	Rb (ppm)	Sr (ppm)	$^{87}Rb/^{86}Sr$	$^{87}Sr/^{86}Sr$	$(^{87}Sr/^{86}Sr)i$
S1/2	104	854	0.3527	0.713765	0.708213
S1/3	81	752	0.3119	0.713418	0.708507