

Debapriya Adhikary, Rajesh Kumar Sahoo and Nirmala Maurya, 2016. Petrography and Geochemistry of New Finding Alkaline Lamprophyre Dyke in Eastern Margin of the Eastern Dharwar Craton, Near Khammam, Telangana, India. *Acta Geologica Sinica* (English Edition), 90(supp. 1): 197.

Petrography and Geochemistry of New Finding Alkaline Lamprophyre Dyke in Eastern Margin of the Eastern Dharwar Craton, Near Khammam, Telangana, India

Debapriya Adhikary^{1,*}, Rajesh Kumar Sahoo¹ and Nirmala Maurya²

1 Geological Survey of India, State Unit: Andhra Pradesh & Telangana, Southern Region, Hyderabad-500068, India

2 Geological Survey of India, Chemical Division, Southern Region, Hyderabad-500068, India

The various parts of Cudappah Igneous Province (CIP)/Prakasham Alkaline Province (PAP) of the Eastern Dharwar Craton (EDC), southern India is known for the occurrence of lamprophyre. Present paper reports a lamprophyre dyke near the Thirtal area, Khammam District, Telangana, India (800080:170190) at the northeastern margin of the EDC. In this present paper the petrology, geochemistry and significance of this occurrence also discussed. The study area mainly consists of granitoids of Peninsular Gneissic Complex (PGC) of the EDC. Regionally, the area is bounded by two Proterozoic sedimentary basins, i.e. in the east Pakhal basin and in the south Cuddapah basin. The lamprophyre of the study area has been intruded within granitoids of the EDC. This NE-SW trending lamprophyre dyke shows petrographic and geochemical similarity with other lamprophyre dykes of the EDC. This dyke is ~0.5 to 1 mt wide having ~50 mt exposed strike length on the bank of Pakhal River. Petrographically clinopyroxene and olivine are present as a phenocryst in the rock showing the panidiomorphic texture; carbonate-rich ocelli also present in the rock. In some of the part carbonate replace the clinopyroxene and olivine. Mineralogy it is dominated by volatile content i.e. amphibole, carbonate, chlorite, epidote and serpentine. All these petrography constitute important evidence for its identification as the lamprophyre. As this rock contains clinopyroxene and olivine as the phenocrysts and mainly plagioclase feldspar in the groundmass, this lamprophyre belongs to alkaline type. In geochemistry the Thirtal lamprophyre is characterized by low SiO₂, generally high MgO, medium Al₂O₃ and high K₂O, also having high FeO + MgO and MgO/FeO. The lamprophyre shows low SiO₂

content varying from 42.00 to ~45.00 wt.%; Na₂O + K₂O from 4.60 to ~4.65 wt.% and K₂O/Na₂O from 7 to 8 wt.%. The chondrite-normalized REE patterns of the studied rocks confirm crystallization from a LREE-enriched magma. The multi-element spider diagrams involving HFSE indicate their source region characteristic as subduction-zone related. Samples plot in overlapping field between subduction zone and within plate field with more affinity towards subduction-related source. Based on combined petrography and geochemistry study, this lamprophyre is considered to belong to the alkaline lamprophyre category in general. The strong correlation between various major and trace elements coupled with high abundance of incompatible and compatible trace elements show that alteration and crustal contamination have no or limited effect on the whole-rock geochemistry of the Thirtal lamprophyre.

Acknowledgment

The authors express their sincere thanks to Shri. B.D.Thappa, ADG & HOD, GSI, SR, Shri. P.A. Ramesh Babu, Dy.D.G., SU: AP & T who have given the opportunity to work on this project, valuable guidance and suggestions. The authors are indebted to Shri. K.K.Behera, Supt.Geologist; Project: STM, SU: T&AP, Geological Survey of India, Hyderabad under whose supervision and direction the study was carried out. Shri. S.N. Mahapatro, Dr. S. Ravi, Dr.K.Chakraborty are gratefully acknowledged for their valuable suggestions and discussion during petrographic study.

* Corresponding author. E-mail: debapriya.adhikary@gmail.com