

PETROLOGY AND GEOCHEMISTRY OF LAMPROPHYRE ROCK TYPES OF SALEM, DHARMAPURI, KRISHNAGIRI, AND NAMAKKAL DISTRICTS, TAMIL NADU.

M. Jayabalan *, S. Udayasankar, J. Thiagarajan, S. Sasikumar, E. Nandhakumar, M. Rajakumaran,
M. Manikandan, and S. Nagamani.

Department of Geology, Government Arts College (Autonomous), Salem, Tamil Nadu.

E-mail: smjg@rediffmail.com

Abstract

Petrological and geochemical characters of lamprophyre rock types associated with mafic alkaline complexes, syenite intrusions and basic dyke rocks of the Southern Granulite Terrain exposed within Salem, Dharmapuri, Krishnagiri and Namakkal districts in Tamil Nadu are discussed. Six newly discovered lamprophyres are described: two from the Omalur Igneous Complex of Salem district, two from Samalpatti Complex, one from the Pikkili Complex of Dharmapuri district and one from the Koraiyar – Mettala area of Namakkal district. The shonkinite/hornblendite dyke from the Red Hills area, Chalk Hills Complex of Salem district is identified as a lamprophyre. The sampled lamprophyres are composed of phenocrystic hornblende, pyroxenes and biotite with groundmass composed of sanidine, orthoclase, sodic and calcic plagioclases and second generation mafic phases. The accessories observed are: Fe-Ti oxides (opaque), relict olivine, sphene, apatite, nepheline and uralite. Geochemistry of the sampled lamprophyres displays involvement of both crustal and mantle components in their genesis. The major and compatible trace elements reflect a mantle source while the incompatible elements, HFSE and REE reflect a crustal/subduction related source. The LILE > HFSE in terms of abundance. The trace and REE elemental data suggests residual (or deficient) garnet, presence of residual amphibole, biotite, and clinopyroxene in the protolith or source region. Trace element ratios imply different degrees of partial melting from different protoliths/sources. Of the seven lamprophyres described, five appear to have been derived in a tectonic setting dominated by earlier to intermediate or progressive stages related to subduction zones while the other two lamprophyres suggest rifting 'within plate' environment probably related to deeper mantle sources.

Keywords: Lamprophyre dykes, Southern Granulite Terrain, Geochemistry, Petrogenesis, Salem, Dharmapuri, Krishnagiri and Namakkal districts.