

Confirmation of Newly Discovered Area in Eppawala Phosphate Deposit Using Geological, Geochemical and Geophysical Methods

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Parent rock of the Eppawala apatite deposit is suggested to be a carbonatite in origin and one of the associated minerals of apatite is magnetite. A high concentration of magnetite has been seen within the deposit. A regional ground magnetic survey concluded that the deposit extends to the North further than the formally known boundaries. Also, the studies indicate that the deposit runs along the E-W direction as two ore bodies. Appear in this study, the newly discovered area in Eppawala phosphate deposit was demarcated using geological, geochemical and geophysical methods. Geological studies revealed the presence of carbonatite and apatite outcrops along E-W direction. Representative soil samples were collected during field work for chemical analysis. As the carbonatite is highly weathered anomalous peak of calcium and magnesium should be recorded in the samples collected along the magnetic anomaly, which in turn help to identify the presence of carbonatite bodies within the subsurface. In deeper horizons along E-W direction, the elemental availability is relatively high (High peak values of Ca, Mg in anomalous area is 5000 mg kg⁻¹, 1655 mg kg⁻¹ and in background it is 890 mg kg⁻¹, 720 mg kg⁻¹, respectively) which indicates the possible presence of subsurface carbonatite bodies. Resistivity surveys were carried out in the study area and resulted resistivity signatures show similarity to the known phosphate deposit. Detailed magnetic map resulted from the magnetic survey done by early workers confirmed the boundary indicated in the magnetic anomaly map. Hence existence of the newly discovered deposit in Eppawala along E-W direction was verified by using integrated geological, geochemical and geophysical study.

Keywords: Carbonatite, Phosphate, 1 D Resistivity, Magnetic Survey

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