

Minerals in Human Geophagic Soils from Selected Rural Communities in Gauteng and Limpopo Provinces in South Africa

Georges-Ivo E. Ekosse¹ and Larry C. Obi²

¹*Directorate of Research and Innovation, University of Venda, P/Bag X5050, Thohoyandou 0950, Limpopo Province, South Africa*

²*Division of Academic Affairs and Research, University of Fort Hare, Eastern Cape, South Africa*

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ABSTRACT Twelve representative human geophagic soil samples collected from selected rural communities in Gauteng and Limpopo Provinces, South Africa, were analyzed using X-ray diffractometry to identify, quantify and characterize their minerals constituents. Kaolinite, smectite, talc, muscovite, quartz, calcite, dolomite, microcline, goethite and hematite were the clay and non-clay minerals identified. Two most dominant minerals in the geophagic soil samples were quartz (35-52 wt%) and kaolinite (31- 53 wt%). Abundances for the other minerals were 8-27wt%. Based on the results, the clay minerals and mineral oxides could serve as elemental sources for supplementation of Al, Na, K, Ca, Mg, and Fe in the bodies of the geophagic individuals. There could however be influential factors such as the soil matrix itself, soil type, chemical form of the element, stomach and intestinal pH, and the soil to solution ratio, which could affect the elemental bio-accessibilities.