

Evaluation of possible toxicity of Potentially Harmful Elements in Geophagic clays from parts of Southeastern Nigeria

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The geophagic clays consumed and dermally applied by adults and children in Calabar and Okon-Eket areas of southeastern Nigeria were assessed in order to evaluate possible toxicity of Potentially Harmful Elements (PHEs)- Cd, As, Pb, Cu and Zn (CALCZ). Thirteen clay samples obtained from open markets and clay mines were air-dried, pulverized and analysed for their elemental constituents using Inductively Coupled Plasma Mass Spectrometry (ICPMS). Ecological and health risk assessments of the clays were conducted using Index of Geoaccumulation (I_{geo}), Contamination Factor (CF) and Degree (C_{Deg}), Pollution Index (PI), Ecological Risk Factor (Er) and Index (RI), Hazard Index (HI) and Cancer Risk Index (CRI). The clays had PHE concentrations (ppm) in the order: Zn (13.0-148.0) > Pb (16.7-55.6) > Cu (5.7-23.0) > As (BDL-15.0) > Cd (BDL-0.2). I_{geo} values for Cd, As, Cu and Zn in the clays were <0, while Pb had a value of (-1) to 1. The clays from Calabar and Okon-Eket had Pb CF values of 1.8 and 1.7, and PI values of 1.4 and 1.3, respectively. Results of I_{geo} , CF and PI calculations revealed moderate Pb contamination in the clays. Low HQ and HI of the PHEs indicates that they pose no immediate risk of non-carcinogenic nor carcinogenic effects to geophagic adults and children. However, the moderate Pb contamination in the clays is a source of health concern, especially for geophagic children.