Determination of essential and toxic elements in clay soil commonly consumed by pregnant women in Tanzania

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Abstract

A habit of eating clay soil especially among pregnant women is a common practice in Tanzania. This practice known as geophagy might introduce toxic elements in the consumer's body to endanger the health of the mother and her child. Therefore it is very important to have information on the elemental composition of the eaten soil so as to assess the safety nature of the habit. In this study 100 samples of clay soil, which were reported to be originating from five regions in Tanzania and are consumed by pregnant women were analyzed to determine their levels of essential and toxic elements. The analysis was carried out using energy dispersive X-ray fluorescent technique (EDXRF) of Tanzania Atomic Energy Commission, Arusha. Essential elements Fe, Zn, Cu, Se and Mn and toxic elements As, Pb, Co, Ni, U and Th were detected in concentrations above WHO permissible limits in some of the samples. The results from this study show that the habit of eating soil is exposing the pregnant mothers and their children to metal toxicity which is detrimental to their health. Hence, further actions should be taken to discourage the habit of eating soil at all levels.

Keywords: Essential elements; Toxic elements; Clay soil; Geophagy; Pregnant women