Tittle: **Bioaccessibility and children health risk assessment of soil-laden heavy metals from school playground and public parks in Accra, Ghana**

Abstract: Parks and playground soils constitute a critical matrix for children exposure to hazardous substances due to their high exposure rate. However, minimal investigation has been conducted in Ghana on the subject, thus the need for this research. One hundred and twenty (120) soil samples were collected between April 2015 and March 2016 and then analyzed for heavy metals using atomic absorption spectroscopy. The health risk posed to school children by the heavy metals laden in soil was assessed via oral bioaccessibility and hazard index. The oral bioaccessibility of the metals was estimated using the simple bioaccessibility extraction test (SBET) method. Iron (Fe) measured the highest range of total metal concentrations of 2785.0–15275.0 mg kg^{-1} followed by Pb of 2.1–284.0 mg kg^{-1}. The oral bioaccessibility of the metals varied significantly with Pb and Cu exhibiting the highest mean values of 47.80% and 54.45%, respectively. The sequence for the mean bioaccessibility result does not correspond with the mean concentration of metals in the soil. The hazard index (HI) for most of the heavy metals indicated no potential non-carcinogenic health risk to children (HI < 1) except for Pb. The prolonged use of leaded fuel in Ghana prior to its outright ban on January 1 2004 and the persistence of Pb in soil media may account for its high risk. The deleterious health effects of Pb on children call for the adoption and implementation of appropriate environmental management of playgrounds so as to mitigate children's exposure to soil-laden heavy metals.