Assessment of Contamination Sources of Trace metals in Wastewater Irrigated Vegetable Garden Soils of Kano, Northern Nigeria

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Abstract

Heavy metal pollution is on the increase especially in urban centers where there were proliferation of industrial estates, vehicular emissions and high wastewater reuse. The distribution and potential contamination sources of trace metals (Fe, Nb, Pb, Rb, Sr, Ti, Y and Zr) in long-term wastewater irrigated garden soils were investigated by using radioisotope excited X-ray fluorescence. The result indicates that the soils have elevated concentration of Fe, Pb, Ti and Y in comparison with mean concentration in soils worldwide. Principal component analysis (PCA) and cluster analysis (CA) were performed and all highlighted the origin of these metals as being from natural sources which we attributed to the weathering of the parent materials from which the soils originated from and also to atmospheric dust deposition. Enrichment factor (EF) calculated using Ti as a reference element revealed little to no anthropogenic influence, further confirming the source as mainly natural.

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