



Contribution ID: 16

Type: Oral Presentation

Health Risk Assessment of Toxic Heavy Metals in Irrigation Water, Rustenburg

Thursday, 6 July 2023 10:20 (20 minutes)

Several water sources and their state in Africa are a major concern due to mining, industrial, and other anthropogenic sources. Water is essential to life and healthy living, and also serves as home to various species of household edible fishes. Unfortunately, its contamination has led to significant deaths resulting from diseases associated with the consumption of contaminated water. Globally, toxic heavy metals are among the numerous contaminants associated with water pollution. In this study, toxic heavy metal concentration in irrigation water used in Rustenburg was measured using inductively coupled plasma-mass-spectrometry, and its associated carcinogenic and non-carcinogenic health risks were assessed. The measured concentration of toxic heavy metals in sampled water ranges from ND (not detected) to 1.20×10^{-4} , 1.00×10^{-5} to 4.00×10^{-4} , ND to 1.24×10^{-2} , 1.20×10^{-4} to 1.84×10^{-2} , ND to 5.47×10^{-2} , 1.30×10^{-4} to 2.75×10^{-2} , and ND to 1.12×10^{-1} for Cd, Pb, Zn, Cu, Ni, Co, and Fe respectively, with mean values of 6.24×10^{-5} , 2.33×10^{-4} , 4.15×10^{-3} , 8.68×10^{-3} , 3.37×10^{-3} , 3.33×10^{-3} , and 5.99×10^{-2} . Non-carcinogenic risk resulting from dermal contact and ingestion of toxic heavy metals in water for adults and children shows no apparent risk to exposed populations because hazard quotient and hazard index values are less than 1. Estimated carcinogenic risk due to dermal contact and ingestion of toxic heavy metals were also less than 10^{-6} , indicating negligible carcinogenic risk, thus making the sampled water safe for agricultural and domestic use for dwellers.

Apply to be considered for a student ; award (Yes / No)?

Yes

Level for award;(Hons, MSc, PhD, N/A)?

N/A

Primary author: Dr OLAGBAJU, Peter Oluwadamilare (North West University, South Africa)

Co-author: Dr WOJUOLA, Olanrewaju Bola (North West University, South Africa)

Presenter: Dr OLAGBAJU, Peter Oluwadamilare (North West University, South Africa)

Session Classification: Nuclear, Particle and Radiation Physics

Track Classification: Track B - Nuclear, Particle and Radiation Physics