3rd International Conference on
Ecology, Ecosystem and Conservation Biology
3rd International Conference on &
Microbial Ecology & Eco Systems
March 18-19, 2019 | Chicago, USA

ACCEPTED ABSTRACTS JOURNAL OF ECOSYSTEM & ECOGRAPHY 2019, VOLUME 9 | DOI: 10.4172/2157-7625-C1-045

Evolution of contamination features and health risk of potentially toxic metals in dust from selected schools in Shiraz megacity, SW Iran

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The concentrations of eight potentially toxic metals (i.e., As, Co, Cr, Cu, Cd, Ni, Pb, and Zn) and their contamination levels in dust collected from some schools of Shiraz city, Iran, have been studied in this work. The Pollution of studied metals was assessed using the pollution index (PI), geoaccumulation index (Igeo), and enrichment factor (EF). The results of calculated PLI showed that the contamination status can more likely belong to the anthropogenic activities in this region. Statistical analyses results also showed that traffic sources and combustion of fossil fuels, as well as industrial activities, are important factors contributing to the rise concentrations of heavy metals in school dust. According to the present situation, the non-cancer risk of individual metals for both, children and adults followed the decreasing trend of Pb> Cr> As> Ni> Cd> Cu> Zn> Co and Cr> Pb> As> Cd> Ni> Cu> Zn> Co, respectively. The HI value of Pb and Cr for children is very close to the safety limit. However, the HI values of other studied metals were in the safe level. In terms of cancer health risk, Cr, As, and Pb present at most of the study schools were found to be within the cancer threshold limit. Meanwhile, the cancer risk of exposure to Cd, Ni, and Co was the lowest and could be neglected. The findings of the present study indicate that more investigations should be spent to potentially toxic metal contaminations of dust from schools of Shiraz city, especially for Cr, As, and Pb.

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