

Abstract Book

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to assess the level of cadmium contamination in Lagos metropolis wetland sediments and the potential health effects.

Wetland core (30cm length) sediment samples were collected from identified wetlands in Lagos metropolis. The samples were dried, prepared and analysed for Cd contents using ICP-MS. Result was compared with statutory guideline values and evaluated using geochemical and, ecological and health risk assessment methods.

Cadmium concentration ranged from 1-73mg/kg. The cadmium concentration in all the wetland sediments was observed to be greater than statutory guideline levels as specified by the WHO/FAO (0.05-0.5mg/kg in food), UNEP (0.03-0.3mg/kg) and EU (0.05mg/kg). The calculated mean value for Cd (23 mg/kg) in the wetland sediments was greater than the Effect Range Median as proposed by USEPA (ERM, 9.6mg/kg) indicating a very high likelihood to cause adverse biological effects. Calculated Geo-accumulation and Contamination Factor revealed considerable to very high contamination for Cd while the calculated Pollution Load Index was >1 indicative of general deterioration of the sediment quality. Ecological assessment revealed high risk with mERM-Q (Effects Range-Median Quotient) values for Cd greater than 1.5mg/kg in the wetlands' sediments indicating highly toxic sediments. The calculated Daily Intake values and Total Chronic Hazard Quotient Index (THI) was > 1 and showed that elevated ecological health risk.

The current Cd status of the wetlands' sediments is of concern as portions of the wetlands are currently cultivated for vegetables. This could provide appropriate pathway for bio-transfer of Cd into the population that may result in debilitating health conditions.

Particulates, microbes in homes and their impact of human health

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In modern era, air pollution is one of the typical problems to human health. People spend their maximum time in indoors (houses or at work place) and affected more in indoor as compare to outdoor. In indoors people affect directly or indirectly by physical, chemical and biological factors. They affected by number of disease like respiratory, pulmonary and allergic reactions at indoor. Biological agents especially fungi are the causal agents for different diseases in animals, plants, and human beings. Otomycosis, chronic bronchitis, emphysema, asthma, allergy as well as systemic mycosis diseases caused only by fungal strains. The present study was conducted to analyze particulate matter and biological agent lie in indoors of middle class houses at Rohtak City, Haryana.

Stream sediment contamination indexes in a U-enriched area

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The occurrence of Potential Toxic elements (PTE) in a river system is influenced by different factors such as geology, mineralogy, hydrology, chemical reactivity, land use and biological activity. Around mine sites, the mineralogical content of the material exploited consists of inert materials from the gangue constituent's mineralization or mineral constituents of rocks. Stream sediments are usually used as a tool for contamination evaluation and definition of PTEs enrichment clusters. The abandoned Picoto uranium mine area is located close to Viseu (central Portugal). The mine is in a soft slope area, with altitudes ranging from 360 to 380 m, and is cut by a stream that runs from Vilar Seco in the NW direction to the Cagavaio stream, in the NE-SW direction. Stream sediments were collected inside and outside the mine influence and Al, Fe, As, Cr, Cu, Mn, Pb, Sr, Th, U, W and Zn contents were determined.

Geoaccumulation index (I_{geo}), contamination factor (CF) and enrichment factor (EF) have been used in the assessment of the PTE contamination degree in stream sediments. The stream sediments are heavily to extremely contaminated in U and Th ($I_{geo}=4-5$) and moderately to heavily contaminated in As and W ($I_{geo}=3-2$). Contamination factor is moderate for Al, Cu and Pb ($1 \leq Cf < 3$), considerable for As and W ($3 \leq Cf < 6$), and very high for U and Th ($Cf \geq 6$). The degree of contamination is very high ($Cd = 50.6$). The EF was also calculated using Al content as a reference value because it does not change significantly in stream sediments. Most stream sediments have a significant enrichment in As, W and U ($EF=5-20$) and are very highly enriched in Th ($EF=20-40$).

The contamination of stream sediments from the Picoto area is due to erosion and leaching of the four mine dumps from the mine area. Furthermore, the contaminant concentrations tend to decrease downstream of the source, due

to hydrodynamic and chemical processes in fluvial systems affected by the mine drainage.

Tracing aluminium production using tree chemistry

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An opportunity emerged in 2011 to retrieve samples from trees growing on Fenn's, Whixall and Bettisfield Mosses National Nature Reserve, a large former raised mire straddling the English-Welsh border. This is a largely rural location, but is unusual in being adjacent to an aluminium smelting site, which has operated since 1941. Trees growing in such localities are potentially receptors of atmospheric emissions, and as such Scots pine trees were sampled at varying distances upwind of the smelter. Sampling involved the collection of tree-ring increment cores, trunk discs, needles (top, middle and base of canopies) and soil from the base of trees. Tree-ring samples were synchronised using dendrochronological techniques, and wood and soil samples subsequently underwent acid digestion and ICP elemental assays.