

Evaluation of bioaccumulation pattern of toxic heavy metals in commonly consumed fishes from East Kolkata Wetlands, a designated Ramsar site of India

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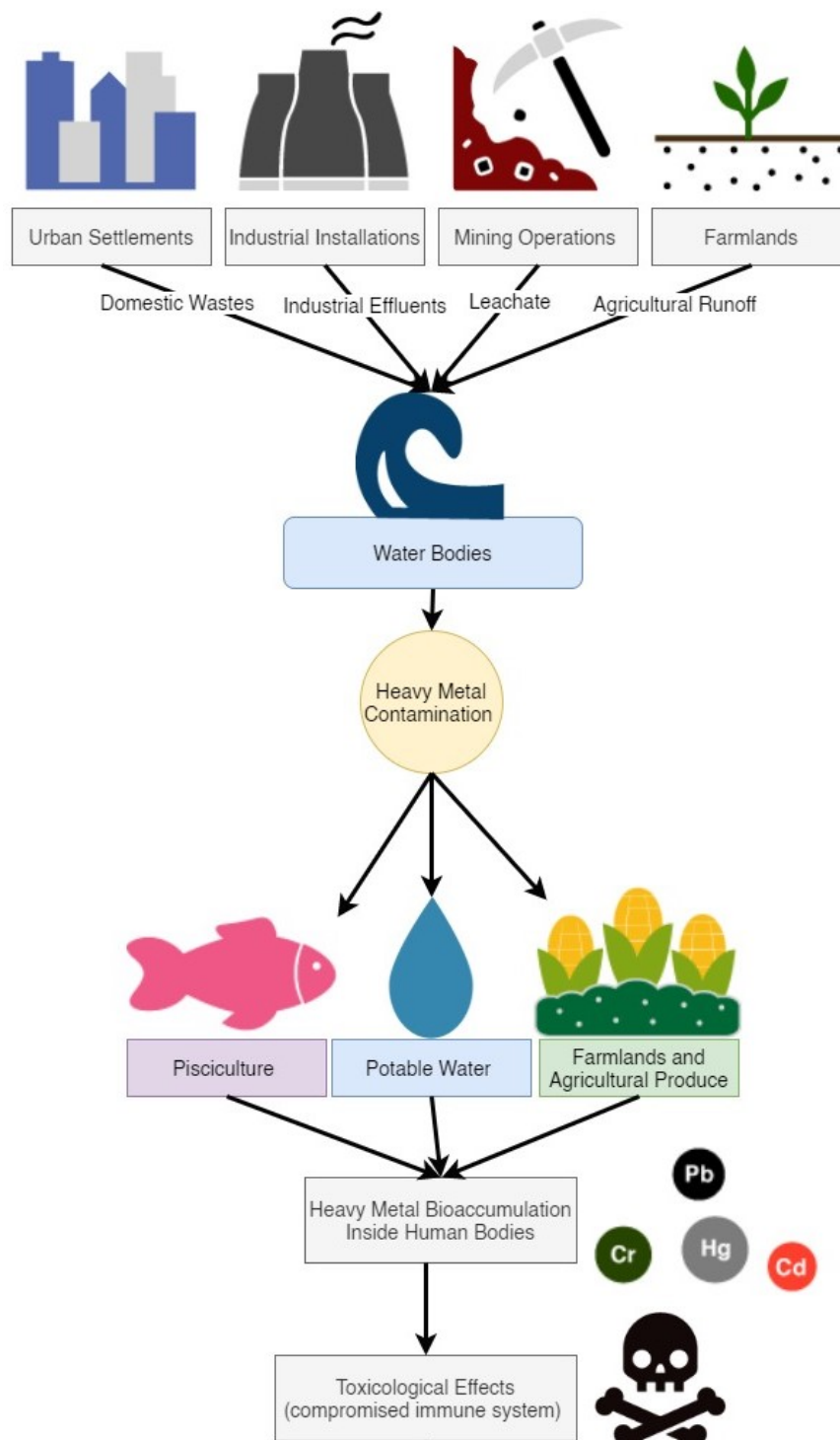
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Abstract

Waste water fed pisciculture is nowadays a feature that is common in aquaculture belts across the globe. East Kolkata Wetlands (EKW) is a nature's wonder where waste water fed natural aquaculture belt is active for more than 70 years now and is efficiently operating as a natural waste management system. The peri urban wetland is also a site of international importance and is listed in Ramsar. Field and lab-based investigations were carried out with three commonly edible carp variety of fishes such as Rohu (Labeorohita), Catla (Catlacatla) and Nile Tilapia (Oreochromis niloticus) collected from ponds (bheries) of the wetland located on the eastern fringes of Kolkata, India. The lab-based analysis reveals the presence of many toxic heavy metals like Lead (Pb), Cadmium (Cd), Chromium (Cr), and Mercury (Hg) in the samples with the seasonal order of accumulation being monsoon > post-monsoon > winter > pre-monsoon in the successive years 2016, 2017 and 2018. The order in which toxic metals are bio-accumulated in fishes is Tilapia > Rohu > Catla. Bioaccumulation of toxic heavy metals shows the trend Pb > Cd > Cr > Hg across all the seasons and years. The ambient media is also investigated to better understand the bioaccumulation pattern at different trophic levels of the ecosystem. Water and sediments were analyzed to evaluate the contamination of toxic heavy metals from point as well as non-point sources. In this study, the observed bioaccumulation pattern of the toxic heavy metals in one of the fragile ecosystems raises questions of environmental management. This study further raises considerable doubt on environmental safety of daily consumed food items.

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