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Chromium Uptake by *Chrysopogon zizanioides* (Vetiver grass) thriving in and around Rania-Khan Chandpur Cr-Contaminated Site, India

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Abstract

A better understanding of hazardous contaminants such as Chromium (Cr) uptake by plants at Chromite ore processing residue (COPR) sites is necessary to design phytoremediation plans. A field-scale assessment of the plants was conducted at the Rania-Khan Chandpur Cr-contaminated site, considered one of India's largest contaminated sites. *Chrysopogon zizanioides* was harvested from the nearby wasteland of a large COPR dump (COPR#1) and a small COPR dump (COPR#2) located in Rania village and a relatively safe area in Khan Chandpur village. Microwave acid digestion followed by Inductively Coupled Plasma Mass Spectrometry (ICP-MS) was analysed to check the concentration of Cr in the shoot of Vetiver grass. We observed Cr concentrations of 41.43 $mgKg^{-1}$, 1.4$mgKg^{-1}$, and 0.65$mgKg^{-1}$ in the shoot of the *C. zizanioides* thriving in wasteland near COPR#1, COPR#2, and in Khan Chandpur village, respectively. This indicates the suitability of *C. zizanioides* in the ecological restoration of such a highly contaminated site. Rural practitioners can actively engage in the co-creation of community-driven decentralized phytoremediation projects by leveraging the insights from this research.

Keyword: COPR, Hazardous Contaminants, Plant Uptake, Wasteland, Phytoremediation