

Elucidating cadmium speciation and bioavailability in Thai paddy soils

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The fluctuation of Eh and pH during rice cultivation due to alternating flooding and draining of paddies can alter Cd chemistry (e.g., speciation, mobility and bioavailability). This research aims to explore the speciation and bioavailability of Cd under an alternating-flooding/draining system in Thai paddy soils highly contaminated by Zn mine discharges using novel synchrotron techniques, SEM-EDX, and a stirred-flow approach. Bulk XAFS data indicate several species of Cd with CdCO₃ as the predominant species in both dry and flooded soils. X-ray microfluorescence images show that Cd tends to localize with Ca and Mn after flooding, while Cd does not appear to be correlated with specific elements in the dry soils. Stirred-flow studies reveal less than 15% of Cd is released. Elucidating Cd speciation and bioavailability in Thai paddy soils is critical for developing and implementing best management practices.

[Biogeochemical Redox Processes in Soils and Sediments](#)

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