

## Effect of clinker ash as Si fertilizer on phytoremediation for heavy metal contaminated water using *Eleocharis acicularis*

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### Abstract

Potentiality of clinker ash as a source of Si and other essential elements on phytoremediation has been investigated by greenhouse and field experiments. Biomass of *Eleocharis acicularis* in tanks with clinker ash was, on average, 1.6 times greater than accumulation in tanks without clinker ash, in the greenhouse experiment lasting 133 days and that in containers with clinker ash was, on average, 1.2 times greater than accumulation in containers without clinker ash, in the field experiment lasting 137 days. Silicon concentrations in *E. acicularis* in tanks with clinker ash were, on average, 1.8 times greater than concentrations in tanks without clinker ash, based on greenhouse experiment data. In the field experiment, concentrations of Cr, Mn, Cu, Zn, As, Cd, and Pb in *E. acicularis* in containers with clinker ash were 542, 144, 1244, 1679, 43.2, 58.9, and 7.72 mg/kg-dry weight (DW), respectively. Concentrations of Cr, Mn, Cu, Zn, As, Cd, and Pb in *E. acicularis* in containers without clinker ash were 376, 150, 2984, 855, 39.4, 54.4, and 8.22 mg/kg-DW, respectively. These result showed that clinker ash is effectively increase the biomass of *E. acicularis* and the accumulations of Cr, Zn, As, and Cd in *E. acicularis*.

**Keywords :** PIXE, Heavy metals, Phytoremediation, Clinker ash, *Eleocharis acicularis*