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APPLICATION OF FLY ASH-STABILIZED MUNICIPAL SEWAGE SLUDGE ON GROWTH OF *Brassica chinensis* AND HEAVY METAL TRANSFER IN POT EXPERIMENT WITH A BARREN SOIL

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Abstract

Pot experiments were performed with a barren soil amended with fly ash stabilized municipal sewage sludge to cultivate *Brassica chinensis*. Accumulation and transformation of heavy metals in the tested soil-plant system were investigated. The results showed that appropriate application of fly ash-sludge mixture could improve the growth of *Brassica chinensis*. The plants cultivated in F30 treatment, which contained 14% (volumetric) sludge and 6% (volumetric) fly ash, presented the highest yield and nutrients and better physiological characteristics. The average bioconcentration factors (BCFs) of the studied heavy metals in the *Brassica chinensis* cultivated in F30 treatment decreased in the order of Sb (8.05) > As (1.50) > Zn (0.84) > Cu (0.44) > Mn (0.16) > Ni = Cr (0.10) > Pb (0.07) > Co (0.06) > Cd = Ti (0.05) > Fe = V (0.02). The concentrations of Cd, As, Ni, Pb, Cr, Cu and Zn in the cultivated *Brassica chinensis* were lower than the maximum permissible concentrations for the vegetables in China. Planting *Brassica chinensis* could reduce the availability of Cu, Zn, Ni, Cr, Mn, Co, As and Sb in the fly ash-sludge amended soil. The long-term effect of repeat application of the fly ash-sludge mixture on soil and plants require further field investigation.

Keywords: accumulation, *Brassica chinensis*, fly ash, heavy metal, municipal sewage sludge

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