Effect of sugarcane vinasse and EDTA on cadmium phytoextraction by two saltbush plants

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Abstract:

Although the use of saltbush plants in metal phytoremediation is well known, there is little information about the impact of sugarcane vinasse (SCV) and EDTA on metal uptake. Heavily cadmium-polluted soil (38 mg kg\(^{-1}\) Cd) was used in pot and incubation experiments to investigate the Cd phytoextraction potential of wavy saltbush (Atriplex undulata) and quail saltbush (Atriplex lentiformis). EDTA at rates of 3, 6, and 10 mM kg\(^{-1}\) soil and SCV at rates of 7, 15, and 30 mL kg\(^{-1}\) soil were added to the polluted soil. The application of EDTA significantly (P = 0.002) reduced the growth of saltbush plants; on the other hand, SCV improved the growth. Both EDTA and SCV increased the availability and root-to-shoot transfer of Cd. The plants of A. lentiformis grown on the soil amended with the highest rate of SCV were able to remove 20.4 % of the total soil Cd during a period of 9 months. Based on the obtained results, it may be concluded that A. lentiformis and sugarcane vinasse could be more effective in the phytoextraction of Cd from the polluted soils.

Keywords:

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