

Effect of manganese on the absorption of cadmium of sorghum grown on hydroponical culture

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Abstract

Cadmium (Cd) is one of the toxic heavy metal to plants and animals. The metal may be incorporated through food to human body. In fact, there are areas whose soil is polluted by Cd. The soil of the Cd-contaminated area must be cleaned up by some methods. Phytoremediation is one of the ways to remove the toxic metal. Sorghum (*Sorghum bicolor*) is one of the plants utilized in the technique of phytoremediation. We investigated the relationship between Cd application and concentration of metal micronutrients in the plant tissues. Our first experiment showed that application of Cd (2 μM) to root medium lowered the concentration of Mn of the plants whereas the other metal micro nutrients were not decreased. The result gave us the hypothesis that Mn might compete with Cd in the rhizosphere and reduce Cd. Thus, in the second experiment, the plants were treated with Cd with varied concentration of Mn (0, 0.25, 12,5 μM). The results showed that the plant growth was enhanced and visual symptoms of Cd toxicity were alleviated by the elevated concentration of Mn. The Cd concentration, however, was not reduced. The result showed that application of Mn as fertilizer to the soil may be effective when the plants will be grown for the purpose of phytoremediation of Cd in the practical Cd-contaminated field.