Removal of chromium from chromium-contaminated soil and physiological response of shallot (Allium ascalonicum L.) on treatments of biochar and mycorrhizae

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Abstract	Food safety and soil degradation were the reasons to treat contaminated soil. Shallots are high-value commodities, so cultivation is carried out intensively. Continuous use of agrochemicals can cause heavy metal contamination. This study aimed to investigate chromium removal, physiological characters, and yield of shallot (Allium ascalonicum L.) on biochar and mycorrhizae application on chromium-contaminated soil. A pot experiment was conducted at the screen house ex-farm of the Faculty of Agriculture, Jenderal Soedirman University. The treatments tested consisted of two factors. The first factor was biochar dosage (B) consisting of 4 levels, i.e., B0 = without biochar, B1 = 1.2 g biochar kg-1 of soil, B2 = 2.4 g biochar kg-1 of soil, and B3 = 4.8 g biochar kg-1 of soil. The second factor was mycorrhizae inoculation consisting of 3 levels, i.e., M0 = without mycorrhizae, M1 = 0.1 g mycorrhizae kg-1 of soil, M2= 0.2 g mycorrhizae kg-1 of soil. The twelve treatments were arranged in a randomized block design with three replications. The results showed that the application of 1.2 g, 2.4 g, and 4.8 g biochar kg-1 of soil had been able to increase plant height and the percentage of root infection. The application of mycorrhizae 0.1 g and 0.2 g mycorrhizae kg-1 of soil was able to increase plant height, percentage of root infection, and plant tissue P uptake. Both applications of biochar and mycorrhizae increased plant height and the percentage of root infection by mycorrhizae.
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