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Effect of municipal solid waste leachate on germination and growth parameters of lepidium sativum

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With increasing world population, there is a need to increase food grain production to an optimum and secure level. Iran is facing water shortage, due to the lack of proper rainfall in recent decades there is a need for decent management of water. During the composting urban solid wastes, large volume of leachate is produced. It is a rich source of organic matter and nutrient elements and due to high volume of leachate produced the effects of MSW leachate on germination and growth parameters of lepidium sativum were studied. Two experiments, one with different MSW leachate to water ratios of 3,10, 70 and 100% and the other with ratios of 1,3,5 and 7% and a control (distilled water) under laboratory conditions were conducted. Chemical properties of MSW leachate were determined before the beginning of experiment. Also, the most suitable method for its microbial detoxification was determined. In first experiment, seeds germinated in all treatments (except in(%100 but due to high toxicity, all seedlings of 10 and 70% treatments died. In second experiment, seeds germinated in all, but it failed in 7% treatment .Maximum germination percentage was observed in 1% and the highest growth rate in 3% treatments, probably due to optimum nutrient elements and the low soluble organic toxicity in these treatments. Seed growth rate of treatments showed a reducing trend compared to control. The highest radicle and plumule lengths and radicle length to plumule length ratio were observed in 1% treatment. The tolerance index of plant in 1% treatment was higher compared to 3% and 5% treatments and had an increase of about 50% .

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