The Effect of Heavy Metal Toxicity on Solanum tuberosum, Cucurbita pepo, Medicago sativa, and Capsicum annuum Plants Inoculated With Mycorrhizae

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In this quantitative research, the possible relationship between arbuscular mycorrhiza (AM) and heavy metal absorption of four different plant genera was examined. The null hypothesis for this research was that there is no significant difference between the effect AM has on the absorption of heavy metals by four different genera of plants. AM spores were inoculated into four different species of plant: Solanum tuberosum (Fortress Russet Potato), Cucurbita pepo (Zucchini), Medicago sativa (Alfalfa), and Capsicum annuum (Red Bell Pepper). The plants were then exposed to heavy metals (copper and zinc) every other week. After an initial growth period of two weeks, the plants were exposed to zinc and copper. After a seven-week growth period, the biomass of the plants and their root systems were taken. Analysis of plant heights and biomass found that plants inoculated with AM had higher survivability rates, higher heights, and more biomass than plants not inoculated with AM. Plants that did not receive AM but were still exposed to heavy metals had lower survival rates, lower sprouting rates, and overall lower plant heights. After running statistical tests, t-tests, it was determined there were significant differences between plants inoculated with AM and almost all groups compared. These t-tests resulted in p-values that rejected the null hypothesis. This data was also able to support the alternative hypothesis that squash plants would be most positively affected by AM in the presence of heavy metals.

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