



Assessment of Heavy Metals Phytotoxicity on Seed Germination and Seedling Growth of Tomato Plants (*Solanum Lycopersicum L.*)

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Abstract

This study has been designed to examine the effects of heavy metals, specifically cobalt (Co), chromium (Cr), cadmium (Cd), and lead (Pb), on the germination indices and growth of different tomato varieties (*Solanum lycopersicum L.*). The current findings revealed that all investigated heavy metals had a significant and detrimental impact on both germination indices and growth parameters at laboratory and greenhouse conditions, with Cd and Pb exhibiting the most pronounced effects. In comparison to the control treatment, the germination percentage decreased by 74.66 and 81.56% when exposed to Pb (380 mg.L⁻¹) in laboratory and greenhouse conditions, respectively. Additionally, the germination time was extended two-folds the duration under Cd and Pb treatments. Pb exhibited a significant impact on the reduction of both hypocotyl and radicle lengths in emerging seedlings, at decrease levels of 51.40 and 59.02%, respectively, compared to the control treatment. The results also indicated that Cd (16 mg.L⁻¹) had the most pronounced effect on the growth parameters of tomato seedlings cultivated in potting soil under greenhouse conditions, although there was no significant difference observed when compared to Pb. The plant lost more than half of its height, as well as 69% of its shoot FW, 68% of its shoot DW, 70% of its root FW, and 74% of its root DW. Now that we know these things, we need to clean up the heavy metal trash that comes from farms. Taking better care of the land and using methods that lessen the effects of metals is one way to improve plant health and long-term production.

Keywords:

Cadmium, hypocotyl, lead, radicle, sensitivity.