World Academy of Science, Engineering and Technology
International Journal of Environmental and Ecological Engineering
Vol:9, No:10, 2015

# The Effects of Copper and Cadmium on Germination and Seedling Growth of Oriental Beech (Fagus orientalis Lipsky) Seeds

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**Abstract :** The toxic effects of copper and cadmium on seed germination, seedling, root, shoot length, and seedling dry biomass of oriental beech (Fagus orientalis Lipsky) was evaluated under laboratory conditions compared to control values. Copper and cadmium treatments at 50, 100, 150, and 200 mg/l affect seed germination and seedling growth of oriental beech as compared to control. Copper treatments at 50, 100, 150, and 200 mg/l concentrations produced significant ($p < 0.01$) effects on seed germination and seedling length of oriental beech while copper treatment at 150 mg/l significantly affected root growth and seedling dry biomass as compared to control. Similarly, cadmium treatments from 50 to 200 mg/l affected the seed germination, root, shoot length, and seedling dry biomass of oriental beech as compared to control. Cadmium treatments showed an adverse effect on seedlings of oriental beech as compared to copper, copper and cadmium treatments at 200mg/l exhibited the lowest percentage of tolerance in seedlings of oriental beech as compared to control.

**Keywords :** copper, cadmium, toxicity, oriental beech
**Conference Title :** ICEES 2015 : International Conference on Environmental and Earth Sciences
**Conference Location :** Istanbul, Türkiye
**Conference Dates :** October 26-27, 2015