

Effect of modified montmorillonite and polyacrylamide on growth parameters and chlorophyll fluorescence of corn in Cd- and Pb-polluted soils

H. Hosseini^{1*}, H. Shirani², M. Hamidpour², H. Shamshiri², H. Dashti², R. Ranjbar-Karimi³

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Abstract

Heavy metals decrease plant growth due to disorder in enzyme activities and destroying of protein structure. Since corn is an important crop in human and poultry nutrition, in this greenhouse experiment, the effect of modified polyacrylamide and montmorillonite on growth parameters and chlorophyll fluorescence of corn (*Zea mays L.*) grown in two polluted soils with Cd and Pb (sandy and sandy loam) was investigated. This experiment was performed using completely randomized design with four replications. Treatments were modified polyacrylamide at three levels (1, 2 and 3 gr/kg soil), modified and natural montmorillonite at two levels (5 and 10 gr/kg soil) and control (no treatment). Polyacrylamide was modified with hydrazine monohydrate and montmorillonite was modified with polyacrylamide. Plants were harvested after 45 days. Wet and dry weights of roots and shoot, stem diameter, stem length, leaf area and chlorophyll fluorescence were determined. The results showed that modified montmorillonite significantly increased dry weight of roots and shoot and leaf area. While, natural montmorillonite didn't have any effect on the growth parameters. Modified polyacrylamide had negative effects on growth parameters and decreased stem length and chlorophyll fluorescence (Fv/Fm) of the corn plants.

Keywords: Soil pollution, Growth parameters, Heavy metals.

1. Dept. of Soil Sci., Vali-e-Asr Univ., Rafsanjan, Iran.
2. College of Agric., Vali-e-Asr Univ., Rafsanjan, Iran.
3. Dept. of Chem., College of Sci., Vali-e-Asr Univ., Rafsanjan, Iran.

*: Corresponding Author, Email: Hadis_hosseini@yahoo.com