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Response of tomato plants under aluminum stress

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Aluminum has been recognized as a toxic element for plant growth and a great number of studies have attempted to determine the toxic concentration of aluminum for different species. Despite decades of intensive research, the primary cause underlying the Al toxicity syndrome in plants has not been elucidated, even though the interaction between Al and Ca2+ is the strongest possibility. The celular mechanism of Al toxicity and tolerance in plant is another not yet elucidated problem. Phytotoxicity of aluminum is characterized by an inhibition of root elongation, but the mechanisms primarily responsible are not well understood. In this work we present our results on response of tomato plants under aluminum stress. In order to study the effects of aluminum cations on tomato plant development, we treated the plants with solutions of m/1000 concentration from four salts which contain aluminum. We monitored the dynamics of germination and the plant growth and then we performed measurements on biologic parameters and photosynthetic activity. Our results showed that the dynamic of germination, shoot length, biomass, and photosynthetic activity have been affected by aluminum treatment. Tomato plants treated with solutions of different salts which contain Al3+ responded in a different manner to this cation. Therefore the degree of germination was higher for untreated seeds than the treated ones; the effects of aluminum on roots resulted in strong inhibition, and structure damage, the most effect being for treatment with KAl(SO4)2*12H2O and the minimal effect being for NH4Al(SO4)2*12H2O. The same effect we can observe for biomass of tomato plants after two month and for content of photosynthetic pigment.