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PROMOÇÃO:



Aluminum affects growth, antioxidant enzyme response and ultrastructures of tomato cv. Micro-tom plants

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Aluminum (Al) is one of the most abundant element on the earth's crust and its availability in the soil is influenced by pH. On acid pH, its availability increases causing toxicity, initially evidenced by the interruption of root growth. Al also affects growth by lower absorption of water and nutrients by the root system. Plants exposed to the Al can generate excess of ROS, causing oxidative damage to cellular metabolism, such as lipid peroxidation and even cell death. This study evaluated Al toxicity in tomato plants subject to 5.0 mM AlCl₃ in hydroponic culture, considering ultrastructural aspects of leaves and roots, growth, lipid peroxidation and antioxidant enzyme response. We observed a decrease in the average diameter root, moderate disruption in the cell layers, mainly in the cortex and in the epidermis that evolved to intense disruption in the root cell layers with the time and lesions in root surface. In leaves, it was possible to identify structural differences in mesophyll and in the palisade and spongy parenchyma of plants submitted to Al. These cells have changed in size and conformation with consequent reduction of the intercellular spaces that may be related to changes in cell death or cell expansion (turgor and plasticity). Ultrastructural analysis of leaves submitted to Al showed lower presence of starch grains and increase of plastoglobuli and mitochondria, when compared to control. After 25 days, there were drastic changes in chloroplasts with disorganization in thylakoid and stroma, with accumulation of phenolic compounds and increase of plastoglobuli. In addition to the commitment of the root system, there was an effect of Al in the shoots, causing changes in lipid peroxidation and decrease of growth and biomass production.

Key-words: Al toxicity, oxidative stress, ultrastructure, chloroplasts, tomato

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