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Ultrastructural Degeneration of the Root Tip Cells during Lead induced Apoptosis in *Zea mays*

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Programmed Cell Death(PCD) is a physiological process occurring during development and in environmental conditions of plants, and apoptosis has been designated as the degenerating morphology of the nucleus and chromatin fragmentations. This research was undertaken to determine the ultrastructural changes of cell organelles in the root tip during lead induced apoptosis. Conventional electron microscopy was applied to the root tip after germination of the *Zea mays* in the Hoagland solution containing 10 μ M, 100 μ M, 1mM, 10mM of lead nitrate. The third phase, degenerating phase, of PCD has begun by increase of the number and size of the vacuoles containing electron dense inclusions. Nucleolus, nuclear membrane, starch grains were much more resistant to high concentration of lead nitrate comparing the other cytoplasmic cell organelles. Fragmentation of the tonoplast, condensation of the nuclear lamina were also observed at this phase of PCD. These cellular degenerations were particularly observed in the cells of periblem, and plerome was thought to be less sensitive with environmental interaction than periblem in seedlings of *Zea mays*.