

특강2

Heavy Metal Accumulation and Phytotoxicity in Tomato Seedlings

Un-Haing Cho

Department of Biology, Changwon National
University

Seedlings of tomato (*Lycopersicon esculentum*) were treated with various concentrations of heavy metals (Cd, Hg and Pb), and the detailed distribution of absorbed metals and the metal-induced phytotoxicity in different plant parts (root, stem and leaves) were investigated. The accumulation of metals in plants increased with external metal concentrations and exposure time, and metals were strongly retained by roots. Among the leaves, the lower positioned older leaves accumulated more metals than the younger leaves. Furthermore, metal exposure not only reduced the dry weight and length of both shoot and root, the levels of chlorophyll in leaves and photosynthesis but also enhanced the concentration of malondialdehyde (a lipid peroxidation product), anthocyanin, acid-soluble thiols, hydrogen peroxide and antioxidant enzymes including superoxide dismutase, catalase and peroxidase in plant tissues. Our results indicate that the physiological impairment of tomato seedlings exposed to toxic levels of metals may be related to the internal distribution of absorbed metals and oxidative stress in different plant parts, and both anthocyanins and thiols may reduce the metal-induced phytotoxicity.

Keywords: metal accumulation, oxidative stress, *Lycopersicon esculentum*