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Growth and Morphology by *Vigna angularis* Respond Differentially to Lead

Sun Young Jin*, Hee Kyung Lee and Jung Hee Hong
Department of Biology, Pusan National University

The toxic effect of various supplies of lead on growth and morphology was investigated in 7-day-old azuki bean (*Vigna angularis*) seedlings. Significant depressions in root elongation was observed in the low concentrations of lead and increasing concentration of the metal caused a sharp decline of root and shoot growth. Lateral root initials was also affected by lead exposure. Inhibition of root elongation by lead was lessened by the presence of aluminium. Analysis of lead localization in root cells by the rhodizonate method showed that lead entered root apices and accumulated in the innermost cortex and vessel regions. Lead treatments caused breakdown of root vascular tissues and decreased the diameter of stem, number of vascular bundles and cell size in shoot. The epidermal cells were disorganized or destructed while the cortical cells exhibited distortion of cell shape and/or disintegration. Increasing lead concentrations caused a decrease in total chlorophyll contents, accompanied by proportional changes in ALAD activity, suggesting a coordinanted reduction of a photosynthetic machinery. Our results indicate that toxic effect of lead appear to be manifested primarily in roots and secondarily on shoots.

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Studies on β -Glucan Synthetase II Activity and Callose Contents in Pollen Tube Development of *Arabidopsis thaliana*

Joung Youn Kang*, Hyeon Sook Cheong¹ and Byoung Sik Pyo
Department of Food and Biotechnology, Dongshin University
Department of Genetic Engineering, Chosun University¹

The β -glucan synthetase II (GSII) activity and the callose contents in the tetrad stage and formation of pollen tube of *Arabidopsis thaliana* were studied. The existence of callose in the tetrad stage could be observed using Lacmoid staining. In the tetrad stage of *A. thaliana*, GSII activity was increased by about 10% and the level of the callose contents was also increased by about 70%. But, after the tetrad stage, the callose was disappeared. Also, the existence of callose in the formation of pollen tube could be observed using Aniline blue staining. In the formation of pollen tube, GSII activity and the callose contents were increased by about 30% more than the other stages (non-flowering and after-flowering stage) respectively. On the other hand, much as in the case of the wild type (LER), in the mutants of *A. thaliana*, that is to say, tt4 and fahl-7, GSII activity was generally increased in the formation of pollen tube, and the callose contents in the tetrad stage was high. These results suggest that callose plays an important role in the growth of pollen tube by increasing GSII activity responsible for synthesizing the callose.