E205

On Phytochelatin Synthesis by Cadmium in *Canavalia lineata*

최혜란.권영명
서울대학교 자연과학대학 생물학과

Effects of cadmium on growth, photosynthesis, glutathione biosynthesis, phytochelatin-cadmium binding complex formation in roots and leaves were examined in *Canavalia lineata*. After 5 days with 50 μM or 100 μM cadmium, growth of roots and leaves of plants was significantly reduced. At 100 μM cadmium, roots did not grow any more on a fresh weight basis. At 50 μM cadmium, phytochelatin contents increased continuously during 5 days up to 26-fold and 5-fold of the control in roots and leaves, respectively, glutathione depeleted, and cysteine, γ-glutamylcysteine increased. The extractable activity of the enzyme of glutathione biosynthesis, γ-glutamylcysteine synthetase, glutathione synthetase increased significantly. Phytochelatin-cadmium binding complexes in roots and leaves were purified by Sephadex G-50 column chromatography. The molecular weight of phytochelatin-cadmium binding complexes was 6,700, 12,400 in roots and leaves, respectively. PS II + I and PS II activities of isolated chloroplast incubated with cadmium were both inhibited in proportion to cadmium concentration, but PS I activity was not.

E206

Canavanine Metabolism in Tissue Cultures of *Canavalia lineata*

황인두.권영명
서울대학교 자연과학대학 생물학과

The greening of callus was achieved by modulating the medium's growth regulator concentrations under continuous light. *Canavalia lineata* calluses formed chlorophyll when they were exposed to continuous light in the presence of benzylaminopurine and indole-3-acetic acid. Canavanine and canaline were detected in the green callus. But only canaline was detected in the white callus grown in the dark. Feedings of canaline to suspension cultures showed that the green suspended cells were capable of *de novo* biosynthesis of canavanine, but the white suspended cells were not. Exogeneously supplied canavanine was used to produce canaline and homoserine by the white suspended cells. Arginase activity was induced by the addition of arginine or canavanine to the medium, and canaline reductase activity was induced by the addition of canaline but not with ornithine in the white suspended cells. The emzyme activities of Krebs-Henseleit ornithine urea cycle were detected in white and green callus. However, the enzyme activities of green callus were higher than green callus.