E216 Effect of Water Stress on Photosynthesis in Pepper (*Capsicum annuum* L.)

Hae Yeon Lee*, Sung Soo Jun and Young Nam Hong
Department of Biology, Seoul National University

The effect of water stress on the photosynthetic response of green pepper was studied. Water stress was induced by immersing plants in the nutrition medium containing varying concentration (5-30%) of polyethylene glycol (PEG 6,000). The decrease in water potential of leaf was time- and concentration-dependent by PEG-treatment. The decrease in both Pmax and quantum yield of O2 evolution correlated with the decrease in water potential of leaf, but Pmax dropped more rapidly than quantum yield at all water deficit conditions tested. In contrast, chlorophyll fluorescence parameters were less affected. Water stress caused by PEG-treatment did not affect the initial fluorescence (Fo) and maximum photochemical efficiency (Fv/Fm) indicating no damage in PSII. The fast induction kinetics of chlorophyll fluorescence showed no change in chlorophyll fluorescence pattern by PEG-treatment at high PFR, but some drop in peak level (Fp) at low light implying diminished photochemical activity at PSII only under low light. The photochemical quenching (qP) was not significantly changed by PEG-treatment in contrast to non-photochemical quenching (NPQ) which was greatly increased especially at high PFR. Measurement of PSI reduction kinetics revealed no damage in electron flow from PSII to PSI, but impaired electron transport to NADP. These results suggest that water stress caused by PEG-treatment results in the reduction of photosynthesis, primarily due to the reduced electron transport to NADP or impaired Calvin cycle.

E217 Ywo Genetically Separable Phases of Growth Inhibition Induced by Blue Light in *Arabidopsis* Seedlings

Myeon Haeng Cho*[1], Brian M. Parks[2], Edgar Spalding[2]
Department of Biology, Yonsei University[1]
Department of Botany, University of Wisconsin at Madison, USA[2]

High fluence-rate blue-light (BL) rapidly inhibits hypocotyl growth in *Arabidopsis thaliana* after a lag time of 30 s. This growth inhibition is always preceded by the membrane depolarization resulted from the activation of anion channels by BL. The membrane depolarization was only 30% of the wild-type magnitude in *hy4*, a mutant lacking the HY4 BL receptor. High-resolution measurements of growth revealed that BL caused a rapid inhibition of growth in wild-type and *hy4* seedlings. This inhibition persisted in wild-type seedlings during more than 40 h of continuous BL. By contrast, *hy4* excaped from the initial inhibition after approx. 1 h of BL and grew faster than wild type for 30 h. Wild-type seedlings treated with 5-nitro-2-(3-phenylpropylamino)-benzoic acid (NPPB), a potent blocker of the BL-activated anion channel, displayed rapid growth inhibition, but similarly to *hy4*, these seedlings escaped from inhibition after approx. 1 h of BL and phenocopied the mutant for at least 2.5 h. Taken together, the results indicate that BL acts through HY4 to activate anion channels causing growth inhibition that begins after 1 h.