Analysis of PSII quantum yield of spinach grown hydroponically in a high concentration of NaCl using chlorophyll fluorescence

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Summary

Maximal quantum yield of photosynthetic photosystm II (PSII) was analyzed in spinach grown hydroponically to investigate effects of addition of NaCl to the nutrient solution using chlorophyll fluorescence. The chlorophyll fluorescence parameter *Fv/Fm* of spinach grown hydroponically with a nutrient solution added 40 mM NaCl (NaCl treatment) was compared to that of spinach grown with the normal nutrient solution (control) over a cultivation period of 29 d. For both treatments, there was a tendency that the value of *Fv/Fm* first increased and then decreased. The value of *Fv/Fm* of spinach in the NaCl treatment was always higher than that in control. This result suggested that maximal quantum yield of PSII increased by addition of NaCl to the nutrient solution. In addition, the effect of continuous dark on *Fv/Fm* of hydroponically grown spinach was investigated. Although the continuous dark caused a decrease in *Fv/Fm* for both treatments, addition of NaCl restrained reduction of *Fv/Fm*. From obtained results, it is suggested that addition of NaCl to the nutrient solution improves the quantum yield of hydroponically grown spinach. Further research on the mechanism of this effect will be necessary.