Phenotypic and Gene Expression Analyses of the SAG12:ipt Transgenic Plants. A Window into the Hormonal Regulated Stress Tolerant Response (C07-vantoai160832-Poster)

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Abstract:

The ipt gene encodes isopentenyl transferase, the rate-limiting enzyme in cytokinin biosynthesis. Transgenic Arabidopsis plants expressing ipt under the control of the senescence-associated SAG12 promoter show normal growth and development. This study determined the temporal patterns of ipt expression, cytokinin accumulation, biomass, sugar and chlorophyll contents during waterlogging or submergence. The results showed that waterlogging did not affect the biomass of SAG12:ipt plants but significantly reduced growth of wild-type plants. The enhanced waterlogging tolerance of the SAG12:ipt plants was accompanied by increased cytokinin and sucrose accumulation. Total submergence inhibited plant growth more than waterlogging, its impacts at the physiological and molecular levels were also different from the impacts caused by waterlogging. Submerged SAG12:ipt plants expressed high levels of the ipt gene but the accumulation of cytokinin was almost non-detectable. The ipt system offers a convenient model to probe the differential impact of waterlogging and submergence stresses on gene expression and the relationship of cytokinin biosynthesis on plant responses to stress.

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