

Effect of Salt Stress on C/N Distribution and Carbon Metabolic Gene Expression in Tomato

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Summary

Salt stress is one of the factor affecting the growth and production of plant. To avoid salt stress, plants regulate the metabolic pathway in source and sink organ. In these processes, some metabolic pathways (glycolysis, TCA cycle etc.) are one of the distribution points between carbon and nitrogen. We focus on one of the related gene encoding phosphoenolpyruvate carboxylase (PEPC) in the dwarf tomato (*Solanum lycopersicum* L. cv. Micro-Tom). A survey of the tomato database shows that the presence of three *ppc* genes (*Slppc*). We designed the gene specific primers to analyze organ specific expression of each *Slppc* gene by RT-PCR. The results indicated that *Slppc1* and *Slppc2* were expressed in leaf, root, seed, flower and fruit organ tested. On the other hand, *Slppc3* was only expressed in fruit. It looks like that *Slppc1* and *Slppc2* were expressed housekeeping, and *Slppc3* may participate in more specialized functions in fruit. Effect of salt stress on *Slppc* genes expression levels in leaves was analyzed. *Slppc1* and *Slppc2* transcripts was increased under short salt stress, although *Slppc3* was not inducible under this conditions. Continuous salt stress, All *Slppc* transcripts were increased within 6 days. PEPC enzymatic activity was also increased. These results show that inducible PEPC promoted the anaplerotic replenishment of TCA cycle intermediates and this pathway leading to amino acid synthesis. In mature red fruit, *ppc* transcripts level were gradually decreased and PEPC activity also tend to decrease lower activity than that in control fruit. Suppressed PEPC may support promotion of glyconeogenesis through enhancement phosphoenolpyruvate carboxykinase in ripening fruit.