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Horticultural Science

Ascorbate metabolism in vegetative and reproductive organs of “cherry” tomato

Tsaniklidis G , Nikoloudakis N., Delis C., Aivalakis G.:

Hort. Sci. (Prague), 41 (2014): 114-121

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Ascorbate metabolism is an essential procedure for all plant cells that plays important roles in several physiological processes such as plant development and reactive oxygen species detoxification. To shed more light on ascorbate metabolism in certain organs of tomato plants, we performed a detailed compartmentalized analysis of ascorbate concentration, ascorbate peroxidase/dehydroascorbate reductase enzyme activities and transcript accumulation of genes related to ascorbate metabolism. Our results showed higher level of ascorbate concentration and ascorbate peroxidase and dehydroascorbate reductase activities in young leaves and shoot tips, while min. ascorbate concentration was recorded in root tips. The study of the expression of the genes involved in ascorbate metabolism revealed that several genes followed similar patterns. However, *APX3* gene expression was considerably higher in reproductive organs, while plastidial *APX6* and *DHAR2* genes transcripts were barely detectable in root tips. Organ-specific expression of genes involved in ascorbate metabolism suggests that different isoenzymes have a specific role in regulation of the redox status of some of the organs in tomato plants.

Keywords:

ascorbic acid; ascorbate peroxidase;
dehydroascorbate reductase;
monodehydroascorbate
reductase; glutathione reductase

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