Sugar Metabolism in Climacteric and Non-Climacteric Melon

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Abstract

Sugar content is one of the most important quality attributes of melon fruits. Understanding the molecular mechanisms involved in the process of sucrose accumulation is essential for possible genetic improvements and optimal fruit cultivation, especially with regard to differences intrinsic to climacteric and non-climacteric fruits. The climacteric physiology and biochemistry are better understood, while with non-climacteric fruits many gaps remain. This article focuses on the metabolic pathway of the Raffinose family oligosaccharides in melon fruits from different maturation groups, with an emphasis on potential candidates for manipulation, such as the different genes of sucrose synthase, invertase inhibitors, genes involved in sucrose hydrolysis-resynthesis, and of the trehalose pathway, recently reported. Such insights may contribute to the understanding of the sucrose accumulation process and its variety-dependent factors and point new directions for the development of technologies that will increase the quality of the melon fruits and of the entire Cucurbitaceae family.