

Sucrose synthase and carbon partitioning in chicory

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Sucrose synthase (SuSy), which catalyses the reversible conversion of sucrose and uridine diphosphate (UDP) into UDP-glucose and fructose, is a key enzyme in a variety of plant metabolic processes. As a major sucrose degrading enzyme *in vivo*, this enzyme plays a central function in the partitioning of sucrose between cell wall biosynthesis [1], starch synthesis [2] and glycolysis [3]. Susy exists at high level in sucrose importing organs such as roots suggesting also a role for this enzyme in carbohydrate partitioning between source and sink organs [4]. Susy has been extensively studied in a wide variety of plants accumulating either sucrose such as sugar beet, or starch such as maize. Still, nearly nothing is known about its presence, its activity or its regulation in chicory (*Cichorium intybus* L.), a member of the Asteraceae that accumulates fructans of the inulin type in its root.

A polyserum directed against a recombinant form of the *A. thaliana* enzyme SUS1 has been produced and has allowed the Western Blot detection of SuSy in protein extracts prepared from chicory roots. Cup-plate assays, based on the transformation of UDP-glucose in a reactive medium, have also been set up to rapidly assess the presence of sucrose synthase activity in root extracts before further analysis by zymograms.

Our results indicate the presence of SuSy throughout the development of the chicory root. The root growth was also characterized by a strong and almost constant sucrose synthase activity leading to the degradation of sucrose. Our results do not exclude the possibility of a close association of sucrose synthase and UDP-glucose dehydrogenase in the chicory root. These unexpected observations are discussed with respect to the implication of these enzymes in metabolic pathways leading to wall synthesis. A cDNA library from chicory root has been set up and SuSy and UDP-glucose dehydrogenase coding sequences isolation is under investigation.

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