

## Expression of Genes Related to Sucrose Partitioning and Metabolism in Cassava

Malinee Suksangpanomrung<sup>1,\*</sup> and Jarunya Narangajavana<sup>2</sup>

<sup>1</sup>National Center for Genetic Engineering and Biotechnology, 113 Thailand Science Park, Paholyothin Rd., Klong 1, Klong Luang, Pathumthani12120, Thailand

<sup>2</sup>Department of Biotechnology, Faculty of Science, Mahidol University, Rama VI Rd., Bangkok10400, Thailand

\* Author for correspondence: Tel +66-2564-6700, Fax +66-2564-6707, Emai: malineec@biotec.or.th

### Abstract

Sucrose is the carbon source for starch biosynthesis in cassava storage roots, but the mechanisms by which sucrose is transferred to the cytosol of parenchyma cells and pathways for utilization are unknown. Phloem unloading of sucrose may occur by either a process mediated by plasmamembrane transporters (sucrose transporters, SUT, or hexose transporters, HET), or via plasmodesmata. Sucrose delivered to the storage root may subsequently be cleaved by four possible mechanisms: by acid invertase (aINV) in the apoplast, by soluble invertase in the vacuoles, or by neutral invertase (nINV) or sucrose synthase (SUSY) in the cytosol. To obtain a greater understanding of the preference route for carbon assimilation during cassava development, the expression of genes associated with sucrose partitioning and metabolism were monitored using a reverse transcription-polymerase chain reaction approach. SUT transcripts were observed in both source (mature leaves) and sink tissues such as immature leaves, fibrous roots and developing storage roots. In contrast, expression of HET and aINV genes was predominant in fibrous roots from non-storage and storage stages, but was undetectable in storage roots. Accumulation nINV transcripts were equally detected in all sink tissues. SUSY transcripts were abundant in fibrous roots, and accumulated at lower levels in other sink organs. Together, these results suggested that sucrose uptake mediated by SUT proteins may be a key process leading to starch biosynthesis in cassava storage roots.

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