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Fructan Synthesis in Transgenic Tomato Plants Expressing Jerusalem Artichoke(*Helianthus tuberosus* L.) *1-sst* and *1-fft*

Kwon Kyoo Kang*[1], Keun Hyang Lee[1], Jin Ha Park[1], Yong Gu Cho[2], Beom Heon Song[2]

[1]*Department of Horticulture, Hankyong National University, 67 Sukjung-dong Ansung-si, Kyonggi-do, South Korea.*
[2]*Department of Agronomy, Chungbuk National University, Chongju 361-763, South Korea*

Objectives

To study the regulation of fructan synthesis in plants, we isolated two full size cDNA clones encoding the two enzymes responsible for fructan biosynthesis in Jerusalem Artichoke (*Helianthus tuberosus* L.) 1-sucrose:sucrose fructosyl transferase (*1-sst*) and 1-fructan:fructan fructosyl transferase (*1-fft*), transformed to tomato and investigated fructan synthesis in transgenic tomato.

Materials and Methods

1. Materials

Jerusalem Artichoke (Helianthus tuberosus L.) for gene cloning

Tomato (Lycopersicum esculentum M cv Chomyoung) for transformation

2. Methods

RT-PCR, Sequence anlysis, Construction of *35S-sst* and *35S-fft* chimeric genes

Agrobacterium-mediated transformation, Southern blot and Northern blot.

Results and Discussion

cDNA clones(*1-sst, 1-fft*) encoding the two enzymes responsible for fructan biosynthesis were isolated from Jerusalem Artichoke(*Helianthus tuberosus* L.) tuber. The deduced amino acid sequence of both cDNAs perfectly matched the sequences of the corresponding purified proteins (*Ingrid et al(1998) The Plant Journal, 15(4)489-500*). Using the 1-sst and 1-fft cDNAs, chimeric genes were constructed driven by the CaMV 35S promoter. Analysis of transgenic tomato plants carrying theses constructs showed that both cDNAs encoding functional fructosyltransferase enzymes. Plants transformed with the *35S-1-sst* construct accumulated the oligofructans 1-kestose, 1,1-nystose and 1,1,1-fructosylnystose. However plants transformed with the *35S-1-fft* construct did not accumulate fructans. TLC analysis shown that tansgenic tomato containing *35S-1-sst* accumulated with high molecular weight fructans in old, senescent leaves.

* Corresponding author: Kwon Kyoo Kang, TEL:031-670-5104, E-mail:kykang@hnu.hankyong. ac.kr