Name: notabilis (not)

Accessions: H7 (LA4487)

Gene ID: Solyc07g056570

Map position: chromosome 7 (long arm)

Gene function: 9-cis-epoxycarotenoid dioxygenase (NCED), a carotenoid cleavage

enzyme.

Gene effect: plants with the mutated allele have low levels of the hormone abscisic

acid (ABA).

Phenotypes: MT-not plants have small leaves that tend to wilt under dry, sunny

conditions, leading to necrosis, particularly on margins.

Comments: Seeds should not be harvest from overripe fruits, otherwise they will

germinate during fermentation of the pulp.

**Description of accessions available**: MT-not is a BC6Fn introgressed from LA0617

(cv. Lukulus)

## Figures:



MT-not (right) showing reduced leaf blade with necrosis in margins. This necrosis is produced when leaves wilt in sunny conditions.

## **Bibliography**

Burbidge A, Grieve TM, Jackson A, Thompson A, Mccarty DR, Taylor IB (1999) Characterization of the ABA deficient tomato mutant *notabilis* and its relationship with maize *Vp14*. Plant Journal 17:427-431.

Burbidge A, Grieve TM, Jackson AC, Thompson AJ, Taylor IB (1997) Structure and expression of a cDNA encoding a putative *neoxanthin* cleavage enzyme (NCE), isolated from a wilt-related tomato (*Lycopersicon esculentum* Mill.) Journal of Experimental Botany 48:2111 – 2112

Burbidge A, Lindhout P, Grieve TM, Schumacher K, Theres K, Van Heusden AW, Bonnema AB, Woodman KJ, Taylor IB (2001) Re-orientation and integration of the

classical and interspecific linkage maps of the long arm of tomato chromosome 7. Theoretical and Applied Genetics 103(2-3): 443-454.

Carvalho RF, Quecini V, Peres LEP (2010) Hormonal modulation of photomorphogenesis-controlled anthocyanin accumulation in tomato (*Solanum lycopersicum* L. cv Micro-Tom) hypocotyls: Physiological and genetic studies. Plant Science, 178:258-264.

Carvalho RF, Campos ML, Pino LE, Lombardi-Crestana SL, Zsogon A, Lima JE, Benedito VA, Peres LEP (2011) Convergence of developmental mutants into a single tomato model system: Micro-Tom as an effective toolkit for plant development research. Plant Methods, 7:18.

Neill SJ, Horgan R (1985) Abscisic acid production and water relations in wilty tomato mutants subjected to water deficiency. Journal of Experimental Botany 36: 1222-1231.

Parry AD, Griffiths A, Horgan R (1992) Abscisic acid biosynthesis in roots. II. The effects of water-stress in wild-type and abscisic-acid-deficient mutant *notabilis* plants of *Lycopersicon esculentum* Mill. Planta 187:192-197.

Parry AD, Neill SJ, Horgan R (1988) Xanthoxin levels and metabolism in wild type and wilty mutants of tomato. Planta 173:397-404.

Tal M (1966) Abnormal stomatal behavior in wilty mutants of tomato. Plant Physiology 41:1387-1391.

Taylor IB, Tarr AR (1984) Phenotypic interactions between abscisic acid deficient tomato mutants. Theoretical and Applied Genetics 68:115–119

Thompson AJ, Andrews J, Mulholland B, McKee J, Hilton H, Horridge J, Farquhar G. Smeeton R, Smillie I, Black C, Taylor I (2007) Overproduction of abscisic acid in tomato increases transpiration efficiency and root hydraulic conductivity and influences leaf expansion. Plant physiology 143:1905-17.

Thompson AJ, Jackson AC, Parker RA, Morpeth DR, Burbidge A, Taylor IB (2000) Abscisic acid biosynthesis in tomato: regulation of zeaxanthin epoxidase and 9-cisepoxycarotenoid dioxygenase mRNAs by light/dark cycles, water stress and abscisic acid. Plant Molecular Biology 42:833–845.

Thompson AJ, Jackson AC, Symonds R, Mulholland B, Dadswell A, Blake P, Burbidge A, Taylor I (2000) Ectopic expression of a tomato 9-cis-epoxycarotenoid dioxygenase gene causes over-production of abscisic acid. Plant Journal, 23: 363-374.

Thompson AJ, Mulholland B, Jackson AC, McKee J, Hilton H, Symonds R, Sonneveld T, Burbidge A, Stevenson P, Taylor I (2007). Regulation and manipulation of ABA biosynthesis in roots. Plant, cell & environment, 30: 67-78.

Thompson AJ, Thorne ET, Burbidge A, Jackson AC, Sharp RE, Taylor IB (2004) Complementation of notabilis, an abscisic acid-deficient mutant of tomato: importance of sequence context and utility of partial complementation. Plant Cell and Environment, 27: 459-471.

Zhang M, Yuan B, Leng P (2009) The role of ABA in triggering ethylene biosynthesis and ripening of tomato fruit. Journal of Experimental Botany, 60:1579-8.