

Supplementary Tables

Supplementary Table 1. Primer identification (id.) for plant genomic DNA PCR screening (for: forward; rev: reverse).

PCR oligonucleotide id.	Sequence 5'-3'	Amplified sequence length
AN4_FW	GGGGACAAGTTTGTACAAAAAAGCAGGCTGGATCCGAAAAAATGGGTA	n.a.
AN4_RV	GGGGACCACTTTGTACAAGAAAGCTGGGTTTCAGTGCAGTTCGTTCAACAA	
PhAN4 for	ATG AAA ACT TCT GTT TTT ACG TCG TC	768 bp
PhAN4rev	TTA TAG TAA TTC CCA GAG GTC AGC ATC	
SIACT41 for	GCTCTTGACTATGAACAGGAAC	126 bp
SIACT41 rev	AAGGACCTCAGGACACCG	
q PhAN4 for	GCCGAAGTCGTGTCCAGAGACG	105 bp
q PhAN4 rev	AAATGCTGAAGTGCTTTCAGTTG	

Supplementary Table 2. Primers used in TLA analysis.

Primer set	Name	Direction	Binding position	Sequence / Position
1	T356	RV	49	TTGTAGAGAGAGACTGGTGA
		FW	131	GGTTCCTTATAGGGTTTCGCT
2	NEO	RV	7548	TGTTCCGCCAGGCTCAAGG
		FW	7685	GTAGCCGGATCAAGCGTATG

Supplementary Table 3. Summary of results from the main research on tomato plants enrichment with anthocyanins obtained by both conventional breeding and genetic engineering approaches.

Gene origin and recipient genotype	Approach	Anthocyanin content	Antioxidant capacity	Reference
<i>ZmLC / ZmCl</i> (<i>Solanum lycopersicum</i> var. FM6203)	Transgenic	Not evaluated (only flavonoids such as quercetin, kaempferol and naringenin were evaluated)	Not evaluated	Bovy et al., 2002
<i>S. chilense</i> ANT1 (<i>Solanum lycopersicum</i> cv. MicroTom)	Transgenic	Evaluated in the leaves of three transgenic lines: ANT1 AX line: 3.574 mg/g FW ANT1 BK line: 0.294 mg/g FW ANT1 AW line: 0.057 mg/g FW	Not evaluated	Mathews et al., 2003
<i>AmDel / AmRos</i> (<i>Solanum lycopersicum</i> cv. MicroTom)	Transgenic	Evaluated in the fruits of four transgenic lines: Del/Ros1 C line: 0.464 mg/g FW Del/Ros1 N line (hemyzygous): 2.835 mg/g FW Del/Ros1 Y line: 0.458 mg/g FW Del/Ros1 Z line: 0.230 mg/g FW	Evaluated in fruits by TEAC: Del/Ros1 N line (hemyzygous): threefold than wild type (~7 mmol TE/Kg FW) Del/Ros C line: less pronounced but still significantly higher than wild type (~ 4 mmol TE/Kg FW)	Butelli et al., 2008
<i>S. chilense</i> ANT1 (<i>Solanum lycopersicum</i> cv. Money Maker)	Transgenic	Evaluated in the ripe fruit peels under seasonal cold treatment of two transgenic lines 35S::ANT1 line C: ~4.000 Peak area / g FW (maximum) 35S::ANT1 line L: ~1.000 Peak area / g FW (maximum)	Not evaluated	Schreiber et al., 2012

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<i>AmDel/Ros1 x AtMyb12</i> (<i>Solanum lycopersicum</i> cv. MicroTom)	Transgenic (gene pyramiding)	Evaluated in the fruits of one transgenic line: Indigo line: ~ 5 mg/g DW	Not evaluated	Zhang et al., 2015
<i>SLAN2</i> (<i>Solanum lycopersicum</i> cv. Zhongshu 6)	Transgenic	Relative content evaluated in fruit peel of three transgenic lines: T-2 line: ~0.3 Abs 530 nm – 0.25 x Abs 657 nm / 100 g FW T-3 line: ~ 0.2 Abs 530 nm – 0.25 x Abs 657 nm / 100 g FW T-4 line: ~ 0.37 Abs 530 nm – 0.25 x Abs 657 nm / 100 g FW	Not evaluated	Meng et al., 2015
<i>AmDel / AmRos</i> (<i>Solanum lycopersicum</i> cv Rubion)	Transgenic	Evaluated in the ripe fruits of one transgenic line: Del/Ros 1 line: 5.8 g/Kg DW	Not evaluated	Su et al., 2016
<i>SLAN11</i> (<i>Solanum lycopersicum</i> cv Ailsa Craig)	Transgenic	Evaluated in the leaves of three transgenic line: Line OX-3: ~ 0.7 A ₅₃₅ /g FW Line OX-4: ~ 0.8 A ₅₃₅ /g FW Line OX-6: ~ 0.5 A ₅₃₅ /g FW	Not evaluated	Gao et al., 2018
<i>SIMYB75 (SLAN2)</i> (<i>Solanum lycopersicum</i> cv MicroTom)	Transgenic (overexpression of the endogenous gene)	Evaluated in the fruits of two transgenic lines: SIMYB75 11 line: ~ 2 mg/g FW SIMYB75 19 line: ~1.3 mg/g FW	Not evaluated	Jian et al., 2019

<p><i>Solanum lycopersicoides</i> (accession LA2408) <i>Abg</i></p> <p><i>Solanum cheesmaniae atv/atv</i></p> <p><i>Solanum chilense Aft/Aft</i></p> <p>(<i>Solanum lycopersicum</i> cv. Ailsa Craig)</p>	Breeding	<p>Evaluated along two agronomical seasons in ripe fruits peel of several transgenic lines among which:</p> <p>LA1996 AftAft 72.32 mg/100g FW</p> <p>LA0797 AftAft atvatv 116.11 mg/100g FW</p> <p>LA0797 Abg- atvatv 414.97 mg/100g FW (season 2004)</p> <p>P20-3x AftAft atvatv 110.79 mg/100g FW</p> <p>LA1996 (no. 2) AftAft 36.35 mg/100g FW</p> <p>LA1996 (no. 1) AftAft 17.68 mg/100g FW</p> <p>LA0797 atv atv 12.10 mg/g FW</p> <p>LA3736 atv atv 7.79 mg/g FW (season 2006)</p>	Not evaluated	Mes et al., 2008
<p>LA2838A x LA1996 <i>Aft/Aft</i> x LA0797 <i>atv/atv</i></p> <p>(<i>Solanum lycopersicum</i> cv Ailsa Craig)</p>	Breeding	<p>Evaluated from skin of ripening fruits:</p> <p>Mature green: ~ 100 mg/100g FW</p> <p>Turning red: ~ 130 mg/100g FW</p> <p>Red ripe: ~ 280 mg/100g FW</p>	Not evaluated	Povero et al., 2011
Breeding line V118	Breeding	<p>Evaluated in ripe fruits:</p> <p>72.31 mg/100 g DW</p>	<p>Evaluated in mature fruits by ORAC:</p> <p>ORAC-lipophilic: 11.97 $\mu\text{mol TE/g DW}$</p> <p>ORAC-hydrophilic: 323.23 $\mu\text{mol TE/g DW}$</p>	Li et al., 2011

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<p>LA1996 <i>AftAft</i> x LA0797 <i>AftAft atvatv</i> (<i>Solanum lycopersicum</i> cv. Ailsa Craig)</p>	Breeding	<p>Evaluated in ripe fruit peel spots of the line: SB (Sun Black): 1.20 mg/g FW_t</p>	<p>TEAC in mature green (MG), breaker (BR) and ripe (RR) fruits: MG: 22.95 μmol TE/g DW BR: 19.90 μmol TE/g DW RR: 31.64 μmol TE/g DW ORAC in mature green (MG), breaker (BR) and ripe (RR) fruits: MG: 104.13 μmol TE/g DW BR: 129.44 μmol TE/g DW RR: 140.30 μmol TE/g DW</p>	<p>Mazzucato et al., 2013 Blando et al., 2019</p>
<p><i>S. chilense Aft</i> / <i>S. cheesemaniae atv</i> (<i>Solanum lycopersicum</i>)</p>	Breeding	<p>Evaluated in peel and pulp of ripe fruits in the line 'Indigo Rose'. Peel: 17 mg/g DW Pulp: 0.1 mg/g DW</p>	<p>ABTS in mature fruits (peel and pulp): Peel: 2.46 mg/100mg DW Pulp: 0.53 mg/100mg DW</p>	<p>Ooe et al., 2016</p>
<p>LA1996 <i>AftAft</i> x LA0797 <i>AftAft atvatv</i> x LA2451 <i>hp2hp2</i> (<i>Solanum lycopersicum</i> cv MicroTom x LAM374 line)</p>	Breeding	<p>Evaluated in the peel of ripe fruits: 90 mg/100g FW</p>	<p>Not evaluated</p>	<p>da Silva Souza et al., 2020</p>