

Supplemental Table S1. Primer sequences for genes involved in carotenoid biosynthesis in sweetpotato

Target gene	Forward (5'-3')	Reverse (5'-3')	Application
<i>IbOr</i>	GCACTGGATCACTAGTCCTT	GTCAATTCGTGGGTCATGCT	Real-time PCR
<i>GGPS</i>	TAAGACGGAGAGCGTGGAGA	TGGGATGACCTTATCACCAT	Real-time PCR
<i>PSY</i>	AAGTTCTTCGACGAGGCTGA	GCAGTTTCTTTGGCTTGCTT	Real-time PCR
<i>PDS</i>	GTACAAAACCGTGCCAGGAT	TCCTTTAAAATCGCCTGTGC	Real-time PCR
<i>ZDS</i>	ATAGCATGGAAGGAGCAACG	AGCTCATCAGATACAGCAGCAG	Real-time PCR
<i>LCY-β</i>	ATGGTGTGACGATTCAAGCA	GCCAATCCATGAAAACCATC	Real-time PCR
<i>LCY-ε</i>	ACCAGTTGGAGGATCATTGC	CACCCATACCAGGACTTCGT	Real-time PCR
<i>CHY-β</i>	CAAGAGAAGGACCGTTCGAG	GACGAACATGTAGGCCATCC	Real-time PCR
<i>ZEP</i>	TGGTACTTGGATCACCGACA	GCTGCCTGCAAACTTTCAT	Real-time PCR
<i>UBI</i>	TCGACAATGTGAAGGCAAAG	CTTGATCTTCTTCGGCTTGG	Real-time PCR

Supplemental Table S2. Primer sequences for genes involved in carotenoid degradation pathway in sweetpotato

Target gene	Forward (5'-3')	Reverse (5'-3')	Application
<i>CCD1</i>	CGGTGGAGAAACTCACGATT	TCCCGATATCTTCGGCATAG	Real-time PCR
<i>CCD4</i>	TGCTGAACCAGAGACTGGAA	TCCGGTGTTCATCATCGTGTA	Real-time PCR
<i>NCED</i>	GGGAAGATCCCGGAGTGTAT	GGACCAATCTATGCGTCTCC	Real-time PCR
<i>CCD7</i>	GGCGAGGTACATTCGGACGG	TCGCCACCTTCCCAGAGACA	Real-time PCR
<i>CCD8-1</i>	AACACCGGCGTCGTCAAAC	CATCCTCGCCACGACGTACC	Real-time PCR
<i>CCD8-3</i>	GCGCAAATCTGCTCAGGGC	GTTGTGCTCGCAGCAATCGG	Real-time PCR
<i>D27</i>	TGGTCCAGGAGTCGGGATGG	TACCATCACGGCCGCAACTC	Real-time PCR
<i>LCD</i>	CGTCATCACTCTCGGCCGTC	CGGGACGTCGGGTTGTTGA	Real-time PCR
<i>ADH</i>	GGGGACGTTGCGGTACTACG	ACAATTGTGCAACCTGCGGC	Real-time PCR
<i>UBI</i>	TCGACAATGTGAAGGCAAAG	CTTGATCTTCTTCGGCTTGG	Real-time PCR

Supplemental Table S3. Carotenoid contents in storage roots

	violaxanthin		cryptoxanthin		13Z- β -carotene		α -carotene		β -carotene		9Z- β -carotene		others		Total	
NT	0.02	±0.00	ND		ND		ND		0.06	±0.01	ND		1.01	±0.19	1.09	±0.20
WT#2	0.07	±0.01	ND		0.05	±0.01	ND		0.11	±0.02	0.10	±0.01	3.18	±0.55	3.52	±0.60
WT#9	0.09	±0.02	ND		0.07	±0.01	ND		0.11	±0.02	0.09	±0.01	1.56	±0.29	1.92	±0.34
WT#10	0.09	±0.01	ND		0.07	±0.01	ND		0.11	±0.02	0.07	±0.01	1.55	±0.30	1.88	±0.36
R96H#1	0.11	±0.02	0.13	±0.02	1.01	±0.14	0.37	±0.07	10.92	±1.19	0.23	±0.02	8.66	±1.55	21.44	±3.01
R96H#9	0.04	±0.00	0.05	±0.01	0.17	±0.03	0.09	±0.01	1.27	±0.14	0.12	±0.01	4.18	±0.38	5.93	±0.58
R96H#10	0.09	±0.01	0.06	±0.01	0.26	±0.04	0.12	±0.02	2.14	±0.13	0.12	±0.01	3.74	±0.72	6.53	±0.94

Supplemental Table S4. Carotenoid contents in leaves

	violaxanthin	lutein	zeaxanthin	cryptoxanthin	13Z-β-carotene	α-carotene	β-carotene	9Z-β-carotene	others	Total
NT	268.0 \pm 50.8	1527.5 \pm 64.1	58.2 \pm 5.2	0.08 \pm 0.00	55.7 \pm 1.5	149.5 \pm 10.8	801.2 \pm 65.1	126.0 \pm 14.6	275.6 \pm 40.5	3261.8 \pm 252.7
WT#2	266.8 \pm 30.4	1557.0 \pm 40.6	53.7 \pm 6.6	0.07 \pm 0.00	42.7 \pm 5.7	158.6 \pm 8.9	708.2 \pm 42.4	118.4 \pm 9.6	251.3 \pm 13.5	3156.8 \pm 157.7
WT#9	295.0 \pm 36.0	1526.5 \pm 69.2	30.0 \pm 5.7	0.07 \pm 0.00	43.6 \pm 6.0	145.0 \pm 13.5	703.2 \pm 68.9	110.8 \pm 11.6	250.2 \pm 23.0	3104.4 \pm 234.0
WT#10	242.1 \pm 31.1	1401.4 \pm 67.8	50.6 \pm 4.0	0.07 \pm 0.00	41.5 \pm 6.6	122.9 \pm 9.8	622.6 \pm 28.4	101.6 \pm 5.2	244.7 \pm 27.6	2827.6 \pm 180.5
R96H#1	287.7 \pm 33.3	1732.6 \pm 95.4	58.6 \pm 2.0	0.07 \pm 0.00	52.8 \pm 5.1	209.5 \pm 13.3	777.3 \pm 39.9	124.6 \pm 8.5	250.4 \pm 43.8	3493.6 \pm 241.2
R96H#9	214.2 \pm 6.0	1516.1 \pm 155.1	57.6 \pm 8.4	0.07 \pm 0.00	46.6 \pm 7.1	189.1 \pm 24.5	670.7 \pm 71.7	111.5 \pm 12.7	231.5 \pm 15.0	3037.4 \pm 300.5
R96H#10	242.5 \pm 43.8	1450.0 \pm 170.1	52.8 \pm 5.0	0.07 \pm 0.00	44.9 \pm 6.5	157.4 \pm 16.8	614.8 \pm 61.3	119.4 \pm 18.3	278.5 \pm 49.0	2960.4 \pm 370.8