

**Table S1.** Primer information.

Primer	Type	Sequence
Actin	Forward	TCCGTGACATGAAGGAGAAG
	Reverse	CTGACCATCAGGAAGCTCATA
PSY1	Forward	CTCCTTCGGATTCTTCCATTC
	Reverse	CTTCCATTTCTGGTTCCTACC
	Product	
PSY2	Forward	GGAGAAGTTTGTGCTGAGTAT
	Reverse	GTCCTTCTACACCACACATAAA
	Product	
CHY $\beta$	Forward	CCGGAACAGTCTGAAGAAGTAA
	Reverse	GCAGCAACCAAGTAAGTAAACC
	Product	
LCY $\epsilon$	Forward	CAGTTGCACAACAAGTCTCAAA
	Reverse	TCATCCACCCAAACACCATAA
	Product	
NCED1	Forward	CTCCGGTTACCGATGAAACTC
	Reverse	GATTAGGACCTACCCTCACAAAC
	Product	

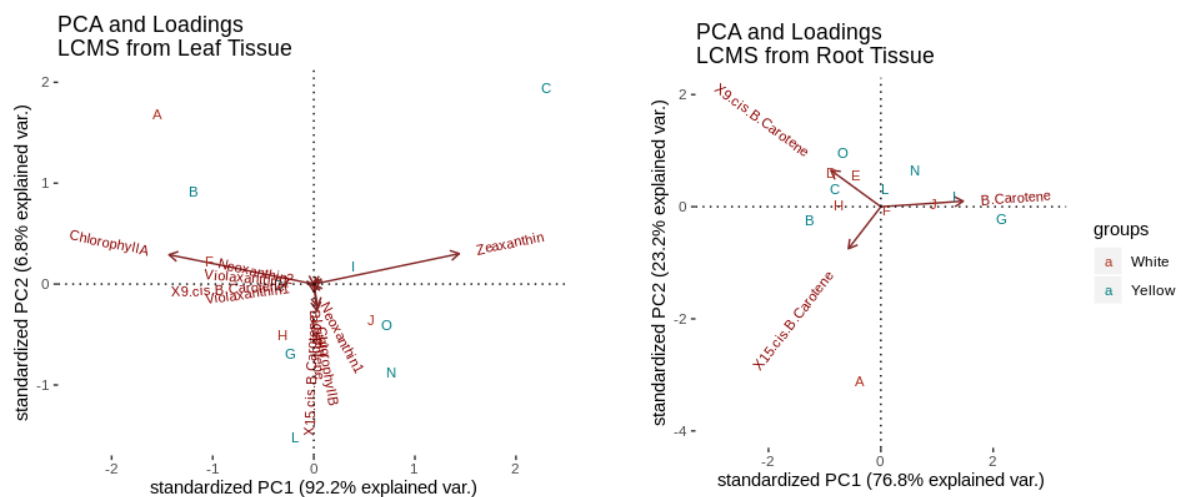
**Table S2.** Agronomic data for average dry matter (DM) and average total carotenoid (TC) composition in storage roots at 13 months.

Row Labels	Number of trials	Average DM	Average TC
KALESO	38	39.9	0
IBA050128	100	33.7	5.5
IBA011231	106	34.3	1.8
IBA083724	200	31.2	8.1
IBA090144	58	31.4	6.7
Z010116	31	21.9	5.2
IBA083565	53	23.1	9.4
MM990214	54	24.8	3.9
IBA011663	284	25.7	8.7
IBA102103	41	18.1	8.1
IBA141092	255	25.3	14.9
IBA141102	21	27.5	14.3
IBA130799	35	22.4	12.4
(blank)			
Grand Total	1276	28.4	10.9

**Table S3.** Relative expression determined by qPCR of carotenoid genes in six cassava genotypes. TE: gene-tested experimental, HE: gene-tested control, HE: housekeeping gene experimental, HC: housekeeping gene control, STDEV: standard deviation.

GENOTYPE	TE	HE	TC	HC	$\Delta$ CtTE	$\Delta$ CtTC	$\Delta\Delta$ Ct	$2^{-\Delta\Delta$ Ct}	STDEV
<b>PSY1</b>									
KALESO	24.67	16.51	24.67	16.51	8.16	8.16	0.00	1.00	0.11
IBA011231	23.43	17.42	24.67	16.51	6.01	8.16	-2.15	4.44	0.26

IBA083724	23.62	18.74	24.67	16.51	4.87	8.16	-3.29	9.77	0.18
IBA011663	22.64	16.69	24.67	16.51	5.94	8.16	-2.22	4.65	0.12
IBA141092	22.61	17.86	24.67	16.51	4.75	8.16	-3.41	10.63	0.11
TMS60444	22.08	17.01	24.67	16.51	5.06	8.16	-3.10	8.55	0.24
<b>PSY2</b>									
KALESO	28.59	17.91	28.59	16.50	10.68	12.09	-1.41	2.66	0.42
IBA011231	27.76	16.69	28.59	16.50	11.07	12.09	-1.02	2.03	0.29
IBA083724	28.33	20.04	28.59	16.50	8.29	12.09	-3.80	13.93	0.59
IBA011663	26.37	20.72	28.59	16.50	5.66	12.09	-6.44	86.53	0.83
IBA141092	25.25	18.40	28.59	16.50	6.85	12.09	-5.24	37.82	0.71
TMS60444	29.26	20.72	28.59	16.50	8.54	12.09	-3.55	11.74	0.16
<b>CHYβ</b>									
KALESO	25.95	16.51	25.95	16.51	9.43	9.43	0.00	1.00	0.24
IBA011231	27.24	17.42	25.95	16.51	9.82	9.43	0.38	0.77	0.53
IBA083724	30.73	18.74	25.95	16.51	11.98	9.43	2.55	0.17	0.26
IBA011663	24.22	17.86	25.95	16.51	6.35	9.43	-3.08	8.47	0.21
IBA141092	26.80	16.83	25.95	16.51	9.96	9.43	0.53	0.69	0.17
TMS60444	27.61	17.69	25.95	16.51	9.92	9.43	0.48	0.72	0.11
<b>LCYε</b>									
KALESO	23.83	16.51	23.83	16.51	7.31	7.31	0.00	1.00	0.15
IBA011231	23.91	17.42	23.83	16.51	6.49	7.31	-0.82	1.76	0.20
IBA083724	23.99	18.74	23.83	16.51	5.24	7.31	-2.07	4.20	0.21
IBA011663	22.85	17.86	23.83	16.51	4.99	7.31	-2.32	5.00	0.00
IBA141092	23.22	16.83	23.83	16.51	6.38	7.31	-0.93	1.90	0.16
TMS60444	24.81	17.69	23.83	16.51	7.12	7.31	-0.19	1.14	0.03
<b>NCED1</b>									
KALESO	22.04	16.51	22.04	16.51	5.52	5.52	0.00	1.00	0.01
IBA011231	21.78	17.42	22.04	16.51	4.36	5.52	-1.16	2.24	0.17
IBA083724	22.43	18.74	22.04	16.51	3.68	5.52	-1.84	3.58	0.47
IBA011663	22.14	17.42	22.04	16.51	4.72	5.52	-0.80	1.74	0.44
IBA141092	21.98	17.86	22.04	16.51	4.11	5.52	-1.41	2.66	0.39
TMS60444	22.65	17.69	22.04	16.51	4.95	5.52	-0.57	1.48	0.36



**Figure 1.** PCA loadings of leaf (A) and root (B) metabolites. KALESO: A, IBA050128: B, IBA011231: C, IBA083724: D, IBA090144: E, Z010116: F, IBA083565: G, MM990214: H, IBA011663: I, IBA102103: J, IBA141092: L, IBA141102: N, IBA130799: O.