













## Supplemental Material – Tables

**Table S1. Colour intensity phenotypes of the *Capsicum annuum* colour discovery panel used in this study.**

Photographs and colour intensity phenotype data for all lines from the colour discovery panel. Colour intensity phenotype was allocated by Syngenta.

Line	Colour intensity phenotype	Description of ripe fruit	
R1	High	Small; thick walled; smooth skin	
R2	High	Long; thin walled; wrinkled skin	
R3	Low	Small; thin walled; smooth skin	
R4	Medium	Long; thick walled; smooth skin	
R5	Medium	Medium; thick walled; smooth skin	

R6	Medium	Medium; thick walled; smooth skin	
R7	High	Long, medium walled, wrinkled skin	
R8	Medium	Small; thin walled; smooth skin	
R9	Medium	Long, thin walled, smooth skin	
R10	Medium	Medium, thin walled, smooth skin	
R11	Medium	Long; thick walled; smooth skin	
R12	Medium	Small, thin walled; smooth skin	

**Table S2. Carotenoid and carotenoid esters identified in red ripe chilli pepper fruit using HPLC-PDA and LC-MS.**

Chromatographic and spectral properties of non-saponified carotenoid extracts prepared from ripe chilli pepper fruit from a high intensity, high retention line (R1). Analysis was performed by HPLC-DAD and LC-MS, compounds with no entry in the MS columns were identified using standards run on the HPLC-DAD. Key: RT, Retention Time.

Peak No.	RT (min)	$\lambda_{\max}$ (nm)	[M+H] <sup>+</sup>	MS/MS	$\Delta m/z$	Compound
1	11.1	286	-	-	-	$\alpha$ -Tocopherol
2	20.1	286	-	-	-	Phytoene
3	21.6	350	-	-	-	Phytofluene-1
4	23.3	350	-	-	-	Phytofluene-2
5	10.5	439, 468	601.4242	-	-	Violaxanthin
6	10.8	436.7, 464.5	-	-	-	Neoxanthin
7	13.1	445.1, 472.9	-	-	-	Antheraxanthin
8	16.2	475.3	585.4295 567.4195	-	18(OH)	Capsanthin
9	17.1	450, 479	-	-	-	Zeaxanthin
10	22.1	442.7, 479	-	-	-	Antheraxanthin (monoester)
11	22.6	453, 481	-	-	-	$\beta$ -Cryptoxanthin
12	24.4	448.8, 472.9	-	-	-	Antheraxanthin (monoester)
13	25.1	447.5, 474.1	-	-	-	Antheraxanthin (monoester)
14	25.9	469.3	767.5960 567.4184	-	200.1776 (C12:0)	Capsanthin- C12:0 (monoester)

<b>15</b>	<b>26.3</b>	471.7	795.6285 567.4196	-	228.2089 (C14:0)	Capsanthin- C14:0 (monoester)
<b>16</b>	<b>26.9</b>	446.3, 475.3	-	-	-	Antheraxanthin (monoester)
<b>17</b>	<b>27.6</b>	453.6, 479	-	-	-	$\beta$ -carotene-1
<b>18</b>	<b>28.2</b>	474.3	-	-	-	Capsanthin- C16:0 (monoester)
<b>19</b>	<b>28.6</b>	453.6, 472.9	-	-	-	$\beta$ -carotene-2
<b>20</b>	<b>29</b>	445.1, 474.1	-	-	-	Antheraxanthin (diester)
<b>21</b>	<b>29.2</b>	494.7	965.7600 565.4035	-	400.3565 (2xC12:0)	Capsorubin- C12:0-C12:0 (diester)
<b>22</b>	<b>29.7</b>	466.9	993.7906 793.6125 765.5815 565.4031	-	200.1782 (C12:0); 228.2043 (C14:0)	Capsorubin- C12:0-C14:0 (diester)
<b>23</b>	<b>30.5</b>	457.2, 481.4	961.8004 761.6233 733.5926 533.414	-	200.1781 (C12:0) 228.2078 (C14:0) 428.3862 (C12+C14)	Zeaxanthin- C12:0-C14:0 (diester)
<b>24</b>	<b>30.5</b>	457.2	-	989.8313 761.6226 533.4147	228.2087 (C14:0) 446.4166 (2xC14:0)	Zeaxanthin- C14:0-C14:0 (diester)
<b>25</b>	<b>31</b>	451.2	-	-	-	Zeaxanthin (diester)

<b>26</b>	<b>31.5</b>	448.8, 471.7	-	-	-	Antheraxanthin (diester)
<b>27</b>	<b>32.1</b>	476.6	949.7634 749.5860 549.4116	MS <sup>2</sup> (749.5860) 549.5753 MS <sup>2</sup> (949.7634) 549.4105	200.0107 (C12:0) 400.3529 (2xC12:0)	Capsanthin- C12:0-C12:0 (diester)
<b>28</b>	<b>32.8</b>	440.3, 471.7	-	-	-	Antheraxanthin (diester)
<b>29</b>	<b>33</b>	480.2	977.7948 777.7644 749.5860 549.4081	MS <sup>2</sup> (977.9441) 777.6167 MS <sup>2</sup> (777.6172) 549.4093 MS <sup>2</sup> (749.5864) 549.4081	200.3274 (C12:0) 228.2079 (C14:0) 200.1783 (C12:0)	Capsanthin- C12:0-C14:0 (diester)
<b>30</b>	<b>33.9</b>	474.1	1005.8266 777.6176 749.5863 549.4093	MS <sup>2</sup> (1006.0266) 778.6251 MS <sup>2</sup> (1006.0266) 549.4047 MS <sup>2</sup> (777.6176) 549.4080	227.4015 (C14:0) 456.6219 (2xC14:0) 228.2096 (C14:0)	Capsanthin- C14:0-C14:0 (diester)
<b>31</b>	<b>34.9</b>	475.3	1033.857 6 805.7760 777.7598 549.4087	MS <sup>2</sup> (1034.0387) 549.4125 MS <sup>2</sup> (805.6504) 549.4058 MS <sup>2</sup> (777.6182) 549.4101	484.6416 (C14:0, C16:0) 256.2446 (C16:0)	Capsanthin- C14:0-C16:0 (diester)
<b>32</b>	<b>35.8</b>	475.3	1061.889 7 805.6498 549.409	MS <sup>2</sup> (1062.4010) 805.6547 MS <sup>2</sup> (805.6475) 549.409	256.7463 (C16:0) 256.2389 (C16:0)	Capsanthin- C16:0-C16:0 (diester)
<b>33</b>	<b>36.4</b>	449, 475	1045.894 3 789.6546 533.4140	MS <sup>2</sup> (1045.8943) 533.4401 MS <sup>2</sup> (789.6546) 533.4219	256.2327 (C16:0) 256.2327 (C16:0)	Zeaxanthin- C16:0-C16:0 (diester)

**Table S3. Carotenoid content throughout ripening in 8 selected lines.**

The carotenoid content ( $\mu\text{g/g DW}$ ) for selected lines was analysed in 6 stages of ripening to observe biosynthesis and accumulation over the ripening process. The stages were (A) mature green (MG), (B) breaker (B), (C) breaker plus 3 days (B+3), (D) breaker plus 7 days (B+7), (E) breaker plus 10 days (B+10), and (F) breaker plus 14 days (B+14). The ripening length within the colour diversity panel varied, thus resulting in some lines displaying longer ripening lengths than others. Values discussed in the text are shown in bold. Statistical analysis was carried out using ANOVA ( $P \leq 0.05$ ). The  $\pm\text{SE}$  was calculated ( $n=3$ ). Key: -, not detected.

**A MG**

Carotenoids	R1	R2	R3	R4	R7	R8	R11	R12
Violaxanthin	40.76 $\pm 16.42$	86.73 $\pm 15.70$	46.91 $\pm 2.81$	160.27 $\pm 24.32$	62.27 $\pm 5.19$	84.49 $\pm 20.56$	128.03 $\pm 20.52$	44.78 $\pm 8.07$
Neoxanthin	15.88 $\pm 4.76$	13.49 $\pm 3.61$	6.66 $\pm 0.75$	52.91 $\pm 8.15$	11.71 $\pm 1.68$	27.11 $\pm 2.50$	55.85 $\pm 7.98$	37.83 $\pm 4.73$
Antheraxanthin	17.33 $\pm 0.88$	17.60 $\pm 3.15$	10.36 $\pm 0.39$	35.52 $\pm 2.46$	13.87 $\pm 2.54$	18.37 $\pm 1.70$	22.96 $\pm 3.00$	16.97 $\pm 3.21$
Chlorophyll B	412.42 $\pm 57.8$	646.13 $\pm 139.87$	253.04 $\pm 24.08$	1066.73 $\pm 103.31$	310.91 $\pm 26.88$	704.43 $\pm 38.80$	960.06 $\pm 150.20$	740.12 $\pm 64.91$
Lutein	<b>463.85</b> <b><math>\pm 44.86</math></b>	<b>856.08</b> <b><math>\pm 181.35</math></b>	<b>399.90</b> <b><math>\pm 51.48</math></b>	<b>1079.31</b> <b><math>\pm 82.33</math></b>	<b>357.51</b> <b><math>\pm 37.75</math></b>	<b>756.68</b> <b><math>\pm 44.45</math></b>	<b>1120.54</b> <b><math>\pm 136.65</math></b>	<b>825.00</b> <b><math>\pm 64.07</math></b>
Zeaxanthin	<b>14.21</b> <b><math>\pm 1.72</math></b>	3.72 $\pm 0.93$	2.70 $\pm 1.11$	17.90 $\pm 4.79$	3.30 $\pm 0.85$	13.31 $\pm 4.09$	4.98 $\pm 2.17$	4.29 $\pm 0.60$
Chlorophyll A	256.5 $\pm$ 215.47	183.62 $\pm 15.70$	<b>344.92</b> <b><math>\pm 108.61</math></b>	-	102.54 $\pm 11.07$	<b>641.86</b> <b><math>\pm 57.30</math></b>	<b>1436.05</b> <b><math>\pm 470.20</math></b>	<b>1354.50</b> <b><math>\pm 132.68</math></b>
$\beta$ -carotene	69.34 $\pm 35.85$	119.80 $\pm 24.87$	53.27 $\pm 5.64$	149.03 $\pm 14.37$	40.08 $\pm 3.30$	122.57 $\pm 7.11$	88.95 $\pm 11.08$	77.36 $\pm 5.55$
$\alpha$ -tocopherol	59.10 $\pm 10.60$	88.35 $\pm 10.23$	84.99 $\pm 7.18$	140.11 $\pm 22.62$	61.60 $\pm 5.40$	134.02 $\pm 14.70$	144.73 $\pm 10.35$	63.12 $\pm 11.45$
Total carotenoid	621.36 $\pm 94.26$	1097.41 $\pm 220.59$	519.79 $\pm 58.14$	1494.94 $\pm 122.16$	488.74 $\pm 41.73$	1022.53 $\pm 73.40$	1421.30 $\pm 173.77$	1006.22 $\pm 83.39$

**B B**

Carotenoids	R1	R2	R3	R4	R7	R8	R11	R12
Violaxanthin	11.47 $\pm 0.24$	33.35 $\pm 3.28$	22.45 $\pm 6.60$	<b>47.97</b> <b><math>\pm 1.58</math></b>	18.81 $\pm 2.95$	25.52 $\pm 6.43$	39.10 $\pm 7.11$	22.09 $\pm 1.93$
Neoxanthin	7.35 $\pm 1.02$	33.44 $\pm 10.4$	8.26 $\pm 1.77$	<b>81.74</b> <b><math>\pm 2.33</math></b>	10.36 $\pm 3.18$	24.87 $\pm 3.78$	33.11 $\pm 2.90$	6.80 $\pm 1.92$
Antheraxanthin	15.36 $\pm 0.77$	19.96 $\pm 3.14$	7.33 $\pm 2.38$	<b>36.82</b> <b><math>\pm 4.44</math></b>	14.05 $\pm 1.21$	26.09 $\pm 1.27$	26.68 $\pm 0.66$	26.28 $\pm 0.86$
Chlorophyll B	293.32 $\pm 36.09$	441.06 $\pm 40.98$	136.58 $\pm 33.23$	706.85 $\pm 21.39$	198.60 $\pm 25.39$	554.76 $\pm 59.80$	557.84 $\pm 69.20$	226.61 $\pm 7.41$
Lutein	-	472.07 $\pm 33.76$	251.59 $\pm 41.31$	877.27 $\pm 56.42$	176.99 $\pm 28.66$	636.19 $\pm 88.32$	897.55 $\pm 70.59$	396.81 $\pm 42.87$

Capsanthin	48.11± 11.42	34.82 ±9.74	25.07 ±13.54	<b>23.21</b> <b>±8.19</b>	56.86 ±15.62	60.47 ±21.01	8.41 ±1.75	40.37 ±13.70
Zeaxanthin	78.26 ±4.19	36.74 ±21.25	26.32 ±15.19	77.80 ±18.35	18.03 ±3.07	155.57 ±30.27	42.64 ±15.49	180.41 ±21.12
Chlorophyll A	79.11 ±0.31	129.55 ±11.32	64.30 ±20.38	-	33.79 ±6.00	337.96 ±78.36	112.73 ±14.58	82.59 ±14.23
β-cryptoxanthin	32.67 ±3.47	22.47 ±5.68	18.72 ±9.85	30.60 ±4.32	13.71 ±3.96	21.69 ±3.88	-	49.68 ±8.04
β-carotene	159.90 ±6.54	108.61 ±16.42	73.08 ±16.51	134.77 ±3.74	52.86 ±8.24	108.40 ±37.91	77.77 ±4.42	101.57 ±15.63
Capsanthin esters	<b>37.28</b> <b>±6.31</b>	<b>20.60</b> <b>±3.93</b>	-	-	<b>46.17</b> <b>±15.69</b>	-	-	-
Zeaxanthin esters	40.66 ±7.71	-	104.88 ±32.18	-	-	44.31 ±23.82	-	53.22 ±20.56
α-tocopherol	59.58 ±1.31	77.19 ±7.94	64.96 ±9.69	143.74 ±11.40	58.19 ±4.11	225.11 ±27.00	152.54 ±6.88	83.47 ±9.80
Total carotenoid	431.05 ±23.90	798.16 ±109.58	472.74 ±67.12	<b>1310.18</b> <b>±52.04</b>	403.28 ±53.80	<b>1114.78</b> <b>±107.42</b>	<b>1135.56</b> <b>±66.71</b>	860.66 ±101.39

**C B+3**

<b>Carotenoids</b>	<b>R1</b>	<b>R2</b>	<b>R3</b>	<b>R4</b>	<b>R7</b>	<b>R8</b>	<b>R11</b>	<b>R12</b>
Violaxanthin	9.14 ±0.29	21.72 ±7.42	-	25.95 ±6.99	50.16 ±3.42	15.25 ±8.07	11.18 ±0.92	-
Neoxanthin	5.58 ±3.36	<b>80.46</b> <b>±32.14</b>	-	17.01 ±2.24	19.22 ±1.86	<b>23.48</b> <b>±11.02</b>	19.98 ±2.98	13.05 ±2.07
Antheraxanthin	25.81 ±6.24	<b>43.55</b> <b>±3.79</b>	3.19 ±1.62	50.08 ±0.46	27.41 ±4.22	23.55 ±3.56	27.72 ±0.97	32.43 ±4.82
Chlorophyll B	202.14±7 6.45	430.6±1 43.51	11.20 ±2.65	220.49 ±27.95	275.48 ±16.47	340.81 ±170.90	191.42 ±17.05	83.55 ±55.65
Lutein	-	272.55 ±97.05	16.98 ±4.18	222.86 ±23.34	129.08 ±2.52	515.19 ±209.54	417.59 ±58.02	181.73 ±91.12
Capsanthin	209.76±2 9.32	265.35 ±96.09	89.08 ±34.50	227.66 ±25.64	<b>96.52</b> <b>±30.75</b>	113.00 ±34.67	62.85 ±7.42	104.14 ±13.36
Zeaxanthin	136.23±2 8.61	97.74 ±40.09	54.64 ±14.95	159.48 ±26.48	<b>30.16</b> <b>±14.45</b>	190.83 ±38.70	98.33 ±16.54	213.53 ±35.44
Chlorophyll A	<b>264.22</b> <b>±166.75</b>	<b>435.1±2</b> <b>08.21</b>	-	-	-	<b>492.90</b> <b>±254.83</b>	-	-
β-cryptoxanthin	<b>114.16</b> <b>±14.80</b>	<b>144.72</b> <b>±30.38</b>	61.85 ±10.28	113.17 ±6.92	35.81 ±11.19	34.36 ±7.05	31.27 ±5.33	48.51 ±11.72
β-carotene	<b>394.32</b> <b>±22.35</b>	<b>312.87</b> <b>±68.43</b>	197.18 ±32.37	160.05 ±24.26	66.60 ±26.66	117.74 ±3.13	60.02 ±3.58	127.57 ±32.30
Anther esters	<b>37.20</b> <b>±3.43</b>	<b>95.78</b> <b>±19.11</b>	30.91 ±3.63	41.31 ±6.62	-	12.53 ±3.36	10.58 ±0.25	28.71 ±6.50
Capsorubin esters	<b>34.64</b> <b>±6.40</b>	-	<b>28.15</b> <b>±3.54</b>	-	-	-	-	-
Capsanthin esters	544.49 ±38.63	607.89 ±179.70	<b>765.93</b> <b>±127.59</b>	475.27 ±42.46	115.74 ±53.07	202.01 ±94.13	141.64 ±10.61	428.37 ±89.69
Zeaxanthin esters	159.21 ±6.72	48.58 ±18.81	84.54 ±12.58	19.88 ±7.48	-	288.96 ±170.31	12.15 ±6.15	54.00 ±17.64
α-tocopherol	114.98 ±2.37	139.89 ±9.08	90.87 ±2.04	198.17 ±12.26	<b>67.34</b> <b>±11.06</b>	<b>271.94</b> <b>±33.17</b>	217.73 ±22.54	162.33 ±15.25
Phytoene	35.98 ±4.90	58.18 ±42.36	<b>93.07</b> <b>±25.47</b>	61.55 ±8.51	-	-	44.84 ±9.51	99.92 ±5.23

Phytofluene	-	-	<b>39.55</b> <b>±9.38</b>	24.44 ±5.47	-	-	10.25 ±2.82	7.91 ±0.79
Total carotenoid	1624 ±72.88	2028.9 ±362.1	1482.33 ±108.93	1598.71 ±83.75	558.77 ±136.80	1556.79 ±73.63	989.43 ±38.84	1259.18 ±145.11

D B+7

Carotenoids	R1	R2	R3	R4	R7	R8	R11	R12
Violaxanthin	15.59 ±0.56	<b>40.02</b> <b>±6.38</b>	10.98 ±1.90	-	35.92 ±10.51	33.21 ±9.63	3.26 ±3.25	19.22 ±5.56
Neoxanthin	12.09 ±8.03	<b>90.91</b> <b>±9.50</b>	-	36.06 ±8.84	<b>23.86</b> <b>±2.26</b>	4.49 ±0.89	3.54 ±0.78	-
Antheraxanthin	30.15 ±2.97	<b>58.98</b> <b>±3.27</b>	<b>11.17</b> <b>±3.12</b>	57.94 ±3.48	<b>60.66</b> <b>±2.48</b>	39.56 ±1.14	25.62 ±4.17	<b>22.50</b> <b>±1.05</b>
Chlorophyll b	60.02 ±17.08	<b>217.39</b> <b>±7.69</b>	-	92.42 ±7.82	<b>257.92</b> <b>±32.18</b>	77.79 ±1.76	45.07 ±7.59	<b>19.51</b> <b>±1.72</b>
Lutein	-	-	-	41.12 ±6.08	<b>98.67</b> <b>±25.71</b>	30.06 ±11.09	60.94 ±32.97	-
Capsanthin	403.61±5 8.30	506.54 ±65.45	92.38 ±26.96	345.80 ±14.42	490.84 ±63.26	454.47 ±65.09	110.87 ±13.43	225.07 ±9.41
Zeaxanthin	72.85 ±6.43	111.75 ±6.66	42.85 ±17.97	113.01 ±6.21	99.00 ±17.37	132.70 ±8.36	73.36 ±6.73	132.81 ±24.90
Chlorophyll a	-	<b>329.56</b> <b>±34.01</b>	-	-	-	-	-	-
β-cryptoxanthin	225.85 ±38.14	<b>527.63</b> <b>±33.98</b>	119.88 ±15.24	228.49 ±31.82	322.03 ±73.47	101.50 ±7.62	25.25 ±3.91	99.04 ±20.27
β-carotene	<b>891.20</b> <b>±98.50</b>	<b>1179.96</b> <b>±92.91</b>	352.06 ±51.80	323.23 ±15.31	472.10 ±119.77	171.76 ±41.82	176.36 ±12.56	328.80 ±46.36
Anther esters	176.67 ±24.03	<b>375.12</b> <b>±41.13</b>	64.30 ±10.89	129.34 ±17.56	198.43 ±44.58	123.99 ±24.00	93.84 ±11.61	80.31 ±5.93
Capsorubin esters	176.10 ±39.42	39.69 ±6.35	114.03 ±28.34	32.64 ±9.79	-	-	8.84 ±11.61	158.60 ±44.20
Capsanthin esters	1899.79 ±192.45	2650.24 ±199.40	2072.84 ±293.56	1276.82 ±158.49	1738.28 ±422.79	1725.83 ±365.21	1204.36 ±213.81	1957.70 ±14.67
Zeaxanthin esters	124.17 ±8.45	<b>204.87</b> <b>±26.73</b>	224.92 ±28.60	36.89 ±2.84	26.41 ±3.01	48.51 ±12.39	73.19 ±15.74	113.90 ±21.40
α-tocopherol	172.49 ±5.57	188.49 ±15.37	167.06 ±21.28	253.83 ±39.10	172.39 ±15.75	374.14 ±7.98	271.11 ±24.25	176.58 ±20.65
Phytoene	108.10 ±28.60	85.97 ±17.87	154.48 ±12.78	240.86 ±57.75	79.27 ±47.85	60.24 ±5.88	560.91 ±98.78	108.39 ±20.18
Phytofluene	49.50 ±12.86	15.49 ±3.52	60.19 ±6.71	99.46 ±18.19	33.69 ±22.58	33.61 ±3.35	74.91 ±7.52	39.37 ±7.56
Total carotenoid	4209.01 ±392.07	6048.70 ±278.58	3502.99 ±453.04	3106.87 ±321.49	3759.12 ±769.10	3045.11 ±473.27	2586.20 ±192.55	3324.31 ±75.68

E B+10

Carotenoids	R1	R2	R3	R4	R7	R8	R11	R12
Violaxanthin	26.43 ±0.61	<b>65.54</b> <b>±8.16</b>	16.15 ±0.26	10.86 ±1.87	<b>57.54</b> <b>±13.97</b>	14.62 ±2.23	10.41 ±1.96	10.13 ±1.12
Neoxanthin	18.33 ±1.68	<b>32.01</b> <b>±11.37</b>	4.81 ±0.63	7.99 ±0.43	<b>32.90</b> <b>±1.83</b>	14.18 ±1.10	4.51 ±1.36	-
Antheraxanthin	25.97 ±2.51	41.68 ±5.84	9.10 ±1.31	45.01 ±1.91	<b>53.39</b> <b>±5.04</b>	38.77 ±1.17	21.07 ±3.04	22.62 ±3.21
Chlorophyll B	26.26	68.65	7.66	49.38	<b>76.42</b>	67.69	31.17	20.84



	±2.10	±21.64	±0.08	±4.85	<b>±7.73</b>	±1.74	±14.59	±3.32
Capsanthin	287.20±2 0.11	<b>507.08</b> <b>±67.69</b>	56.16 ±9.03	297.55 ±24.89	<b>664.60</b> <b>±37.74</b>	391.93 ±17.15	96.99 ±8.01	178.50 ±36.27
Zeaxanthin	56.10 ±1.93	81.18 ±3.78	21.86 ±4.10	77.03 ±8.84	<b>109.19</b> <b>±20.01</b>	131.78 ±17.89	62.17 ±7.56	95.87 ±26.22
β-cryptoxanthin	180.10 ±8.31	<b>758.83</b> <b>±50.49</b>	135.82 ±7.51	296.35 ±27.62	<b>595.56</b> <b>±36.05</b>	155.75 ±32.84	96.19 ±14.84	103.83 ±29.30
β-carotene	720.54 ±72.36	<b>1954.77</b> <b>±100.36</b>	320.06 ±105.59	636.82 ±63.59	<b>1940.70</b> <b>±88.09</b>	417.02 ±107.01	229.08 ±22.90	424.55 ±79.86
Anther esters	181.65 ±12.09	<b>461.57</b> <b>±38.49</b>	62.68 ±2.31	203.30 ±28.83	<b>510.05</b> <b>±47.84</b>	187.87 ±17.29	135.53 ±31.07	127.12 ±2.95
Capsorubin esters	213.72 ±21.01	25.77 ±6.41	118.38 ±6.58	86.88 ±8.85	43.14 ±2.55	-	50.46 ±13.21	179.10 ±22.02
Capsanthin esters	2356.79 ±119.44	<b>4528.57</b> <b>±318.89</b>	2299.42 ±409.41	1849.04 ±211.28	<b>4228.99</b> <b>±451.64</b>	2335.33 ±136.05	1492.85 ±215.95	2760.57 ±206.19
Zeaxanthin esters	98.90 ±7.47	73.28 ±5.71	278.26 ±51.36	41.01 ±5.78	90.14 ±0.19	91.49 ±3.04	59.95 ±12.08	127.45 ±35.15
α-tocopherol	194.79 ±2.83	303.67 ±47.15	177.67 ±19.24	301.36 ±8.16	271.15 ±24.95	485.78 ±28.63	307.72 ±9.85	208.16 ±8.69
Phytoene	97.37 ±37.60	468.47 ±197.02	103.22 ±47.14	336.74 ±24.25	<b>377.75</b> <b>±82.24</b>	129.46 ±13.01	872.43 ±277.96	108.39 ±44.31
Phytofluene	47.76 ±15.79	<b>220.10</b> <b>±73.27</b>	37.17 ±18.96	155.78 ±15.46	192.17 ±39.35	70.23 ±7.25	132.42 ±35.66	40.18 ±15.11
Total carotenoid	4348.50 ±148.22	9390.80 ±587.34	3834.77 ±451.32	4163.71 ±355.76	9090.61 ±511.14	4114.24 ±56.71	3332.75 ±218.99	3324.31 ±75.68

F B+14

Carotenoids	R1	R2	R4	R7
Violaxanthin	68.05 ±17.60	67.18±7.39	26.92±3.32	71.74± 3.02
Neoxanthin	14.13 ±1.36	26.28±3.05	16.14±1.50	33.47± 5.40
Antheraxanthin	20.44 ±0.36	49.69±1.63	52.21±3.51	48.53± 4.82
Chlorophyll B	16.48 ±4.21	58.35±9.31	39.35±1.26	45.70± 6.18
Capsanthin	<b>202.45 ±0.01</b>	<b>561.50±55.20</b>	<b>232.55±27.80</b>	<b>617.69±52.97</b>
Zeaxanthin	35.39±5.72	112.38±5.93	71.33±9.65	133.55±5.64
β-cryptoxanthin	285.65±22.06	710.21±7.85	353.46±39.79	846.39±45.91
β-carotene	<b>1018.29±59.09</b>	<b>2523.91±82.72</b>	<b>400.45±83.31</b>	<b>2874.48±281.86</b>
Anther est	324.85±23.68	555.49±20.36	193.60±16.21	534.24±43.56
Capsorubin est	154.55±19.39	123.42±12.89	102.88±18.82	-
Capsanthin est	<b>3290.89±179.33</b>	<b>4686.36±237.43</b>	<b>2666.10±194.28</b>	<b>5653.29±432.50</b>
Zeaxanthin est	100.54±25.95	77.20±7.67	20.82±6.76	115.20±16.51
α-tocopherol	274.92±11.07	389.19±19.76	420.79±21.76	376.30±47.18
Phytoene	127.02±10.99	727.21±85.99	378.16±31.49	672.72±242.63
Phytofluene	70.18±6.70	376.89±27.37	159.40±8.44	331.84±107.44
Total carotenoid	5848.30 ±156.99	11164.78 ±366.66	4776.358±181.222	12126.56 ± 1128.2





**Table S6. One-way ANOVA.**

(A) Phytoene synthase activity (DPM) and (B) phytoene synthase activity / molecule of enzyme (DPM/ unit area).

**A**

	Significance	
	R3	R7
<b>Psy activity (DPM)</b>		
PG vs Mem I	***	***
PG vs Fibril	***	***
PG vs Mem II	***	***
PG vs Stroma	***	***
Mem I vs Fibril	ns	ns
Mem I vs Mem II	***	*
Mem I vs Stroma	***	*
Fibril vs Mem II	***	**
Fibril vs Stroma	***	**
Mem II vs Stroma	***	ns

**B**

	R3 v R7	Significance
<b>PG</b>	0.000633	***
<b>Mem I</b>	0.000645	***
<b>Fibrillar</b>	0.004868	***
<b>Mem II</b>	0.130755	ns
<b>Stroma</b>	0.017656	**