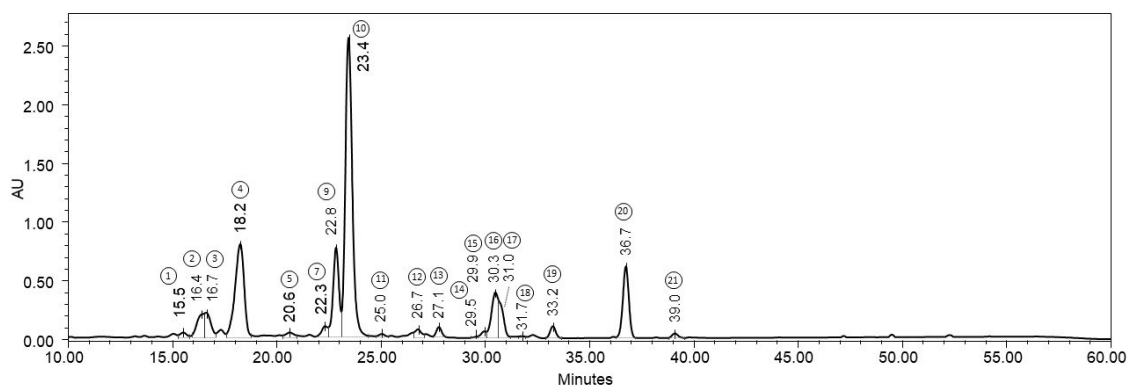
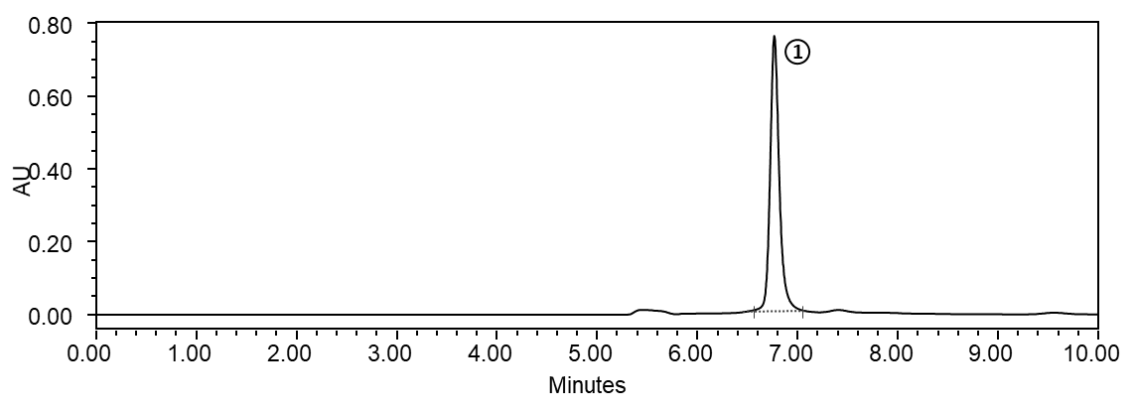


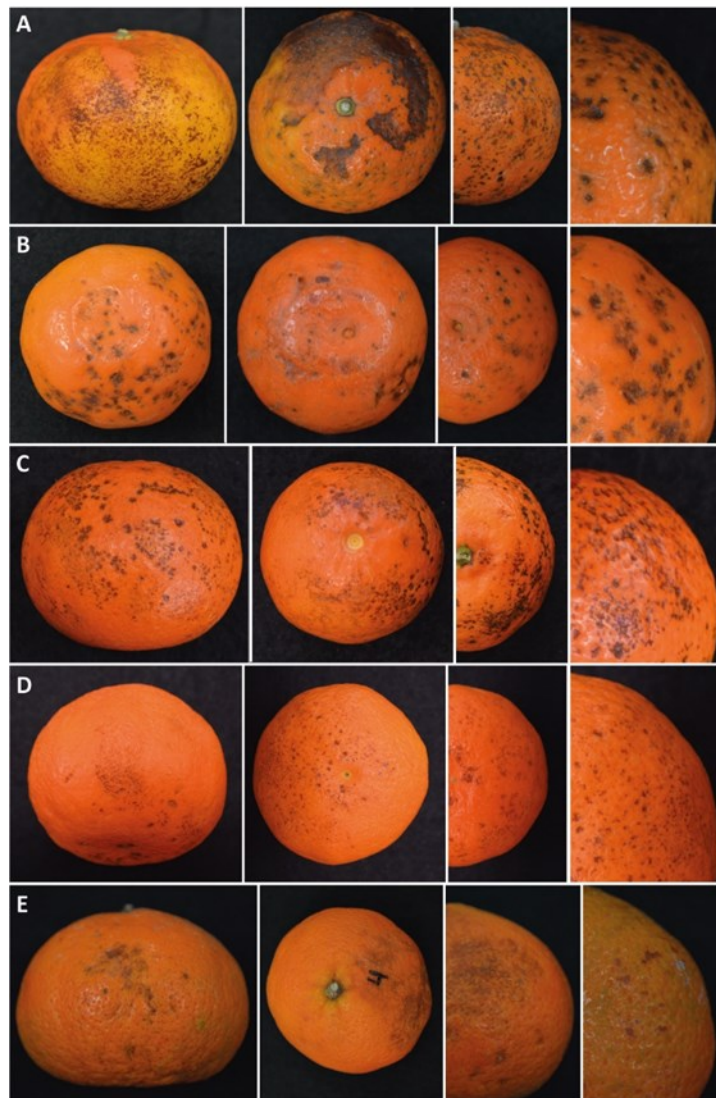
**Figure S1.** Pictures of the scale used to rate the severity of CI symptoms during postharvest cold storage. Score 0: no pitting; Score 1: small pits covering <25 % of the fruit surface; Score 2: larger and darker pits covering between 25-50 % of the surface; and Score 3: severe damage covering >50 % of the surface.



**Figure S2.** MaxPlot chromatogram of the saponified carotenoid extract of the Nadorcott flavedo at harvest. Peaks correspond to (1) NI (327(Z), 411,433,461); (2) NI (327(Z), 405,428,456); (3) NI (328(Z), 409,431,458); (4) All-*E*-violaxanthin; (5) Luteoxanthin; (7) NI (415,438,469); (9)  $\beta$ -citraurin; (10) 9-*Z*-violaxanthin; (11) Luteoxanthin isomer; (12) Lutein; (13) NI (410,435,464); (14) Zeaxanthin; (15) Mutatoxanthin; (16) Antheraxanthin; (17) 15-*Z*-Phytoene; (18) NI (sh,446,470); (19) Phytofluene; (20)  $\beta$ -cryptoxanthin; and (21)  $\zeta$ -carotene. Missing peaks in the chromatogram but present in Table S1 are carotenoids not present in this specific sample (i.e. peak 6, 8 and 22). Peaks not numbered in the chromatogram do not show the absorbance carotenoid-type spectrum.



**Figure S3.** HPLC chromatogram at 248 nm showing ascorbic acid peak (1).



**Figure S4.** Pictures illustrating CI symptoms severity and magnification of CI development in fruit of Fortune non-covered (**A**) and covered (**B**), Nova non-covered (**C**) and covered (**D**), and covered fruit of Nadorcott (**E**).

**Table S1.** Carotenoid quantification parameters. Carotenoids were quantified by HPLC-PAD by integration of the peaks in MaxPlot chromatograms (Waters Empower Software). Violaxanthin isomers, luteoxanthin and other xanthophylls not specified were quantified using (all-*E*)-violaxanthin (CaroteNature).  $\beta$ -Citraurin was quantified using  $\beta$ -apo-8'-carotenal (Extrasynthese). Standards of lutein, zeaxanthin and  $\beta$ -cryptoxanthin were purchase from Extrasynthese, and antheraxanthin from CaroteNature. Phytoene and phytofluene were HPLC-purified from sweet orange Pinalate extracts [36] and used as standards for quantification. The concentrations of (Z)-isomers were determined using the corresponding (all-*E*) xanthophylls. The limits of detection (LOD) and working linear range are indicated for lutein, violaxanthin, antheraxanthin, zeaxanthin,  $\beta$ -cryptoxanthin, phytoene, phytofluene,  $\beta$ -apo-8'-carotenal.

Carotenoid	LOD <sup>a</sup>	Working linear range (mg/L)
Phytoene	25	1.52 to 350
Phytofluene	20	1.21 to 200
$\beta$ -Cryptoxanthin	10	0.55 to 99
Zeaxanthin	14	0.72 to 85
Antheraxanthin	11	0.54 to 102
Violaxanthin	14	0.76 to 98
Lutein	15	0.21 to 120
$\beta$ -apo-8'-carotenal	14	0.82 to 60

<sup>a</sup> The LOD was calculated as the amount (in ng) load on column at which the signal level of the carotenoid reaches at least 3 times the signal noise of the baseline.

**Table S2.** Chromatographic and spectroscopic characteristics of carotenoids found in the flavedo of the three mandarin cultivars.

Peak	Retention time (min)	Carotenoid <sup>a</sup>	UV-Vis absorption maxima (nm)	D <sub>B</sub> /D <sub>II</sub> <sup>b</sup>
1	15.5	NI	327(Z), 411, 433, 461	0.31
2	16.4	NI	327(Z), 405, 428, 456	0.26
3	16.7	NI	328(Z), 409, 431, 458	0.34
4	18.2	*All- <i>E</i> -violaxanthin	415, 438, 468	
5	20.6	Luteoxanthin	396, 421, 448	
6	21.2	NI <sup>F, N</sup>	sh, 425, 450	
7	22.3	NI	415, 438, 469	
8	22.6	NI <sup>F</sup>	409, 431, 459	
9	22.8	β-citraurin	459	
10	23.4	*9- <i>Z</i> -violaxanthin	328(Z), 412, 436, 464	0.06
11	25.0	Luteoxanthin isomer	398, 416, 443	
12	26.7	*Lutein	sh, 443, 472	
13	27.1	NI	410, 435, 464	
14	29.5	*Zeaxanthin	sh, 450, 475	
15	29.9	Mutatoxanthin	sh, 427, 450	
16	30.3	*Antheraxanthin	329(Z), sh, 441, 469	0.06
17	31.0	*15- <i>Z</i> -Phytoene	285	
18	31.7	NI <sup>N, Na</sup>	sh, 446, 470	
19	33.2	*Phytofluene	331,346,364	
20	36.7	*β-cryptoxanthin	423,450,479	
21	39.0	*ζ-carotene	378, 399 ,424	
22	43.5	NI <sup>N, Na</sup>	sh, 450, 480	
<sup>a</sup> *, identified using authentic standards; NI, not identified; <sup>F</sup> , only in Fortune; <sup>N</sup> , only in Nova; <sup>Na</sup> , only in Nadorcott. <sup>b</sup> Intensity of Z peak as ratio D <sub>B</sub> /D <sub>II</sub> .				