Supporting Information

Singlet Fission in Naturally-Organised Carotenoid Molecules

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HPLC Measurements

The pigments were separated by HPLC and detected by a spectrophotometric diode-array detector, which monitors absorbance at 450 nm and records absorption spectra for each fraction detected. Pigments were identified by retention time and absorption spectrum, by comparison with standards or libraries. The pigments were then quantified at 450 nm according to their chromatographic peak areas and their response factors given by running standards or from their literature values. The measured composition was very similar to that reported previously for daffodil chromoplasts, dominated by lutein (51.1%) and violaxanthin (37.2%), together with traces of oxidized lutein (6.7%), neoxanthin (0.8%), cis-neoxanthin (1.3%), cis-violaxanthin (1.3%) antheraxanthin (1.0%) and zeaxanthin (0.5%)

	t-neoxanthin	c-neoxanthin	t-violaxanthin	luteoxanthin	c-violaxanthin	antheraxanthin	Lutein	zeaxanthin
Peak area (450 nm)	48258	68291	2263643	390025	76576	55226	2940450	27425
concentration (ng/uL)	1.7	2.7	78.1	14.2	2.8	2.1	107.2	1.0
%	0.8	1.3	37.2	6.8	1.3	1.0	51.1	0.5

Table S1: Quantification of carotenoid concentration in extract of daffodil chromoplasts, as assessed by HPLC-UVDAD at 450 nm

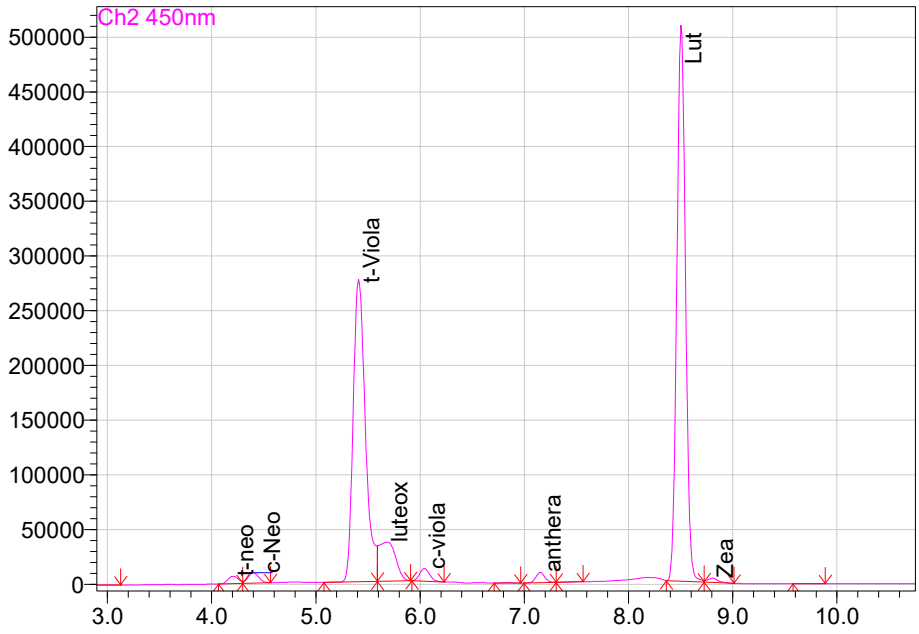

Figure S1/ *HPLC-UVDAD analysis of pigments in daffodil chromoplasts, 450 nm.*

Absorption spectra simulations

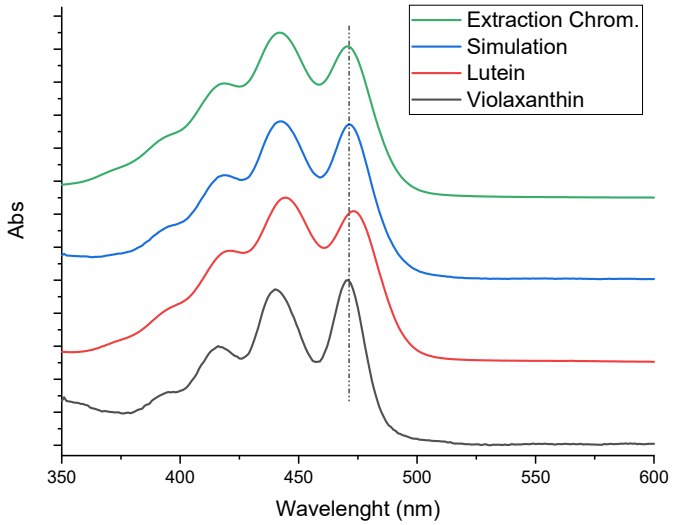

Figure S2| *Absorption spectra at room temperature of violaxanthin (black), lutein (red), and daffodils chromoplast extract (green) in n-hexane. Also shown, in blue, is a simulation of the spectrum for the chromoplast extract, by addition of the Lutein and Violaxanthin spectra in the proportion determined for the extract by HPLC (51.1 & 37.2 %, respectively).*