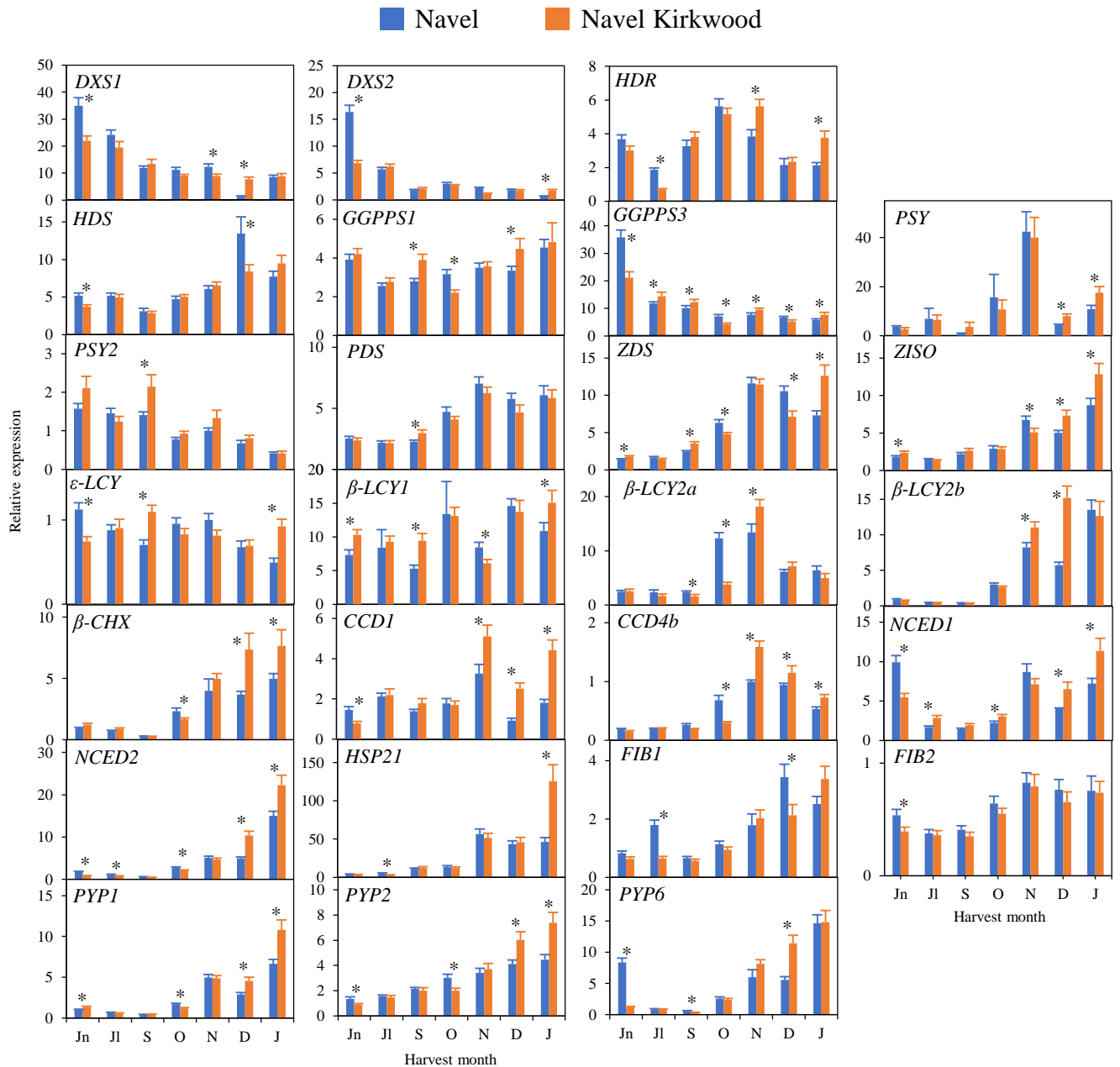
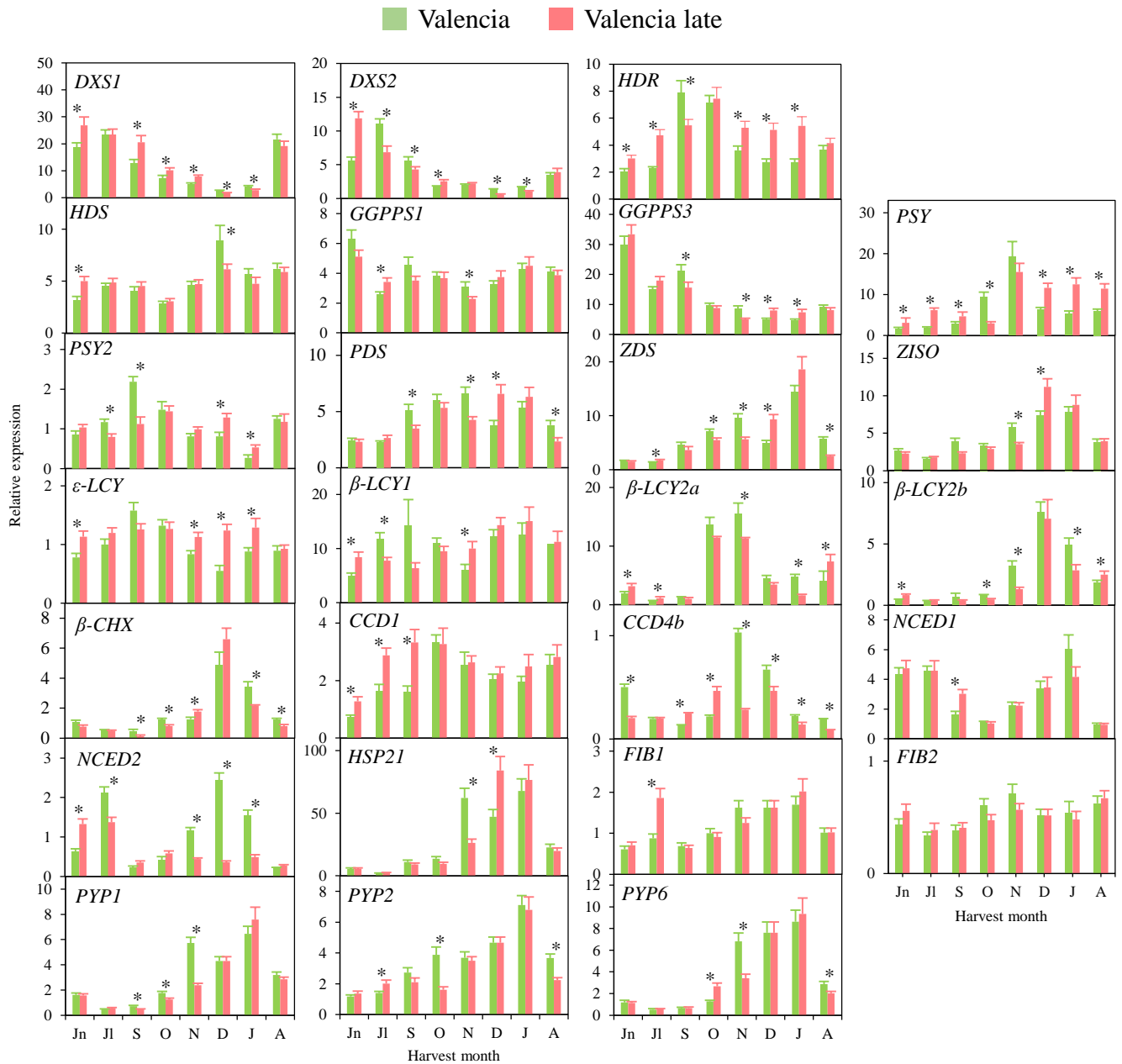


Supplementary Figure 1. HPLC profiles of saponified carotenoid extracts in pulp of fruit from (a) Washington Navel and (b) Kirkwood Navel Navel at full mature stage (January). All profiles are MaxPlot chromatograms (each carotenoid shown at its individual λ maxima). AU, Absorption units. The number peaks correspond to (1) 400-429-417; (2) All-*E*-violaxanthin; (3) Luteoxanthin; (4) 9-*Z*-violaxanthin; (5) 416-442-S; (6 and 6') Mutatoxanthin isomers; (7) Lutein; (8) Zeaxanthin; (9) Antheraxanthin; (10) Phytoene; (11) α -Cryptoxanthin; (12) Phytofluene; (13) β -Cryptoxanthin; (14 and 14') Neurosporene isomers (15) *z*-carotene; (16) β -carotene; (17 and 17') *d*-carotene isomers; (18) 13-*Z*-lycopene; (19) all-*E*-Lycopene.



Supplementary Figure 2. Relative expression levels of genes of carotenoids precursors (*DXS1*, *DXS2*, *HDR*, *HDS* and *GGPPS1* and *GGPPS3*), carotenes and xanthophylls biosynthesis (*PSY*, *PSY2*, *PDS*, *ZISO*, *ZDS*, *β-LCY1*, *ε-LCY*, *β-LCY2a*, *β-LCY2b*, *β-CHX*), carotenoids catabolism (*CCD1* and *CCD4b*), ABA biosynthesis (*NCED1* and *NCED2*), carotenoid-associated proteins (*HSP21*, *FIB1* and *FIB2*) and xanthophyll esterification (*PYP1*, 2 and 6) in the flavedo of Navel and Kirkwood during fruit development and maturation. Jn, June; Jl, July; S, September; O, October; N, November; D, December; J, January. Data are the mean of three biological replicates ± SD. Asterisks indicate significant differences between genotypes by unpaired Student's t-test ($p < 0.05$).



Supplementary Figure 3. Relative expression levels of genes of carotenoids precursors (*DXS1*, *DXS2*, *HDR*, *HDS* and *GGPPS1* and *GGPPS3*), carotenes and xanthophylls biosynthesis (*PSY*, *PSY2*, *PDS*, *ZISO*, *ZDS*, β -*LCY1*, ϵ -*LCY*, β -*LCY2a*, β -*LCY2b*, β -*CHX*), carotenoids catabolism (*CCD1* and *CCD4b*), ABA biosynthesis (*NCED1* and *NCED2*), carotenoid-associated proteins (*HSP21*, *FIB1* and *FIB2*) and xanthophyll esterification (*PYP1*, 2 and 6) in the flavedo of Valencia and Ruby during fruit development and maturation. Jn, June; Jl, July; S, September; O, October; N, November; D, December; J, January; A, April. Data are the mean of three biological replicates \pm SD. Asterisks indicate significant differences between genotypes by unpaired Student's t-test ($p < 0.05$).

Lycopene β -cyclase1a (β -LCY1a) (GenBank Acc OP441052)

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Lycopene β -cyclase1b (β -LCY1b) (GenBank Acc OP441053)

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Lycopene β -cyclase2a (β -LCY2a) (GenBank Acc OP441054)

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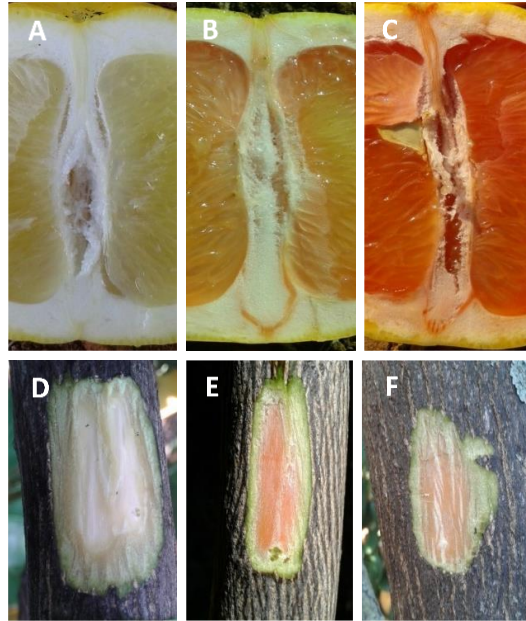
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Lycopene β -cyclase2b (β -LCY2b) (GenBank Acc OP441055)

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Lycopene ϵ -cyclase a (ϵ -LCYa) (GenBank Acc OP441056)

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Supplementary Figure 5. Representative pictures of longitudinal sections of Marsh (A), Rio Red (B) and Star Ruby (C) grapefruits, and trunks of Marsh (D), Rio Red (E) and Star Ruby (F) grapefruit trees growing at the Citrus Germoplasm of the IVIA (Moncada, Valencia, Spain). Note the red colour of the notch and vascular axis of the fruit, and distinctive pigmentation of the inner bark and wood for each variety.