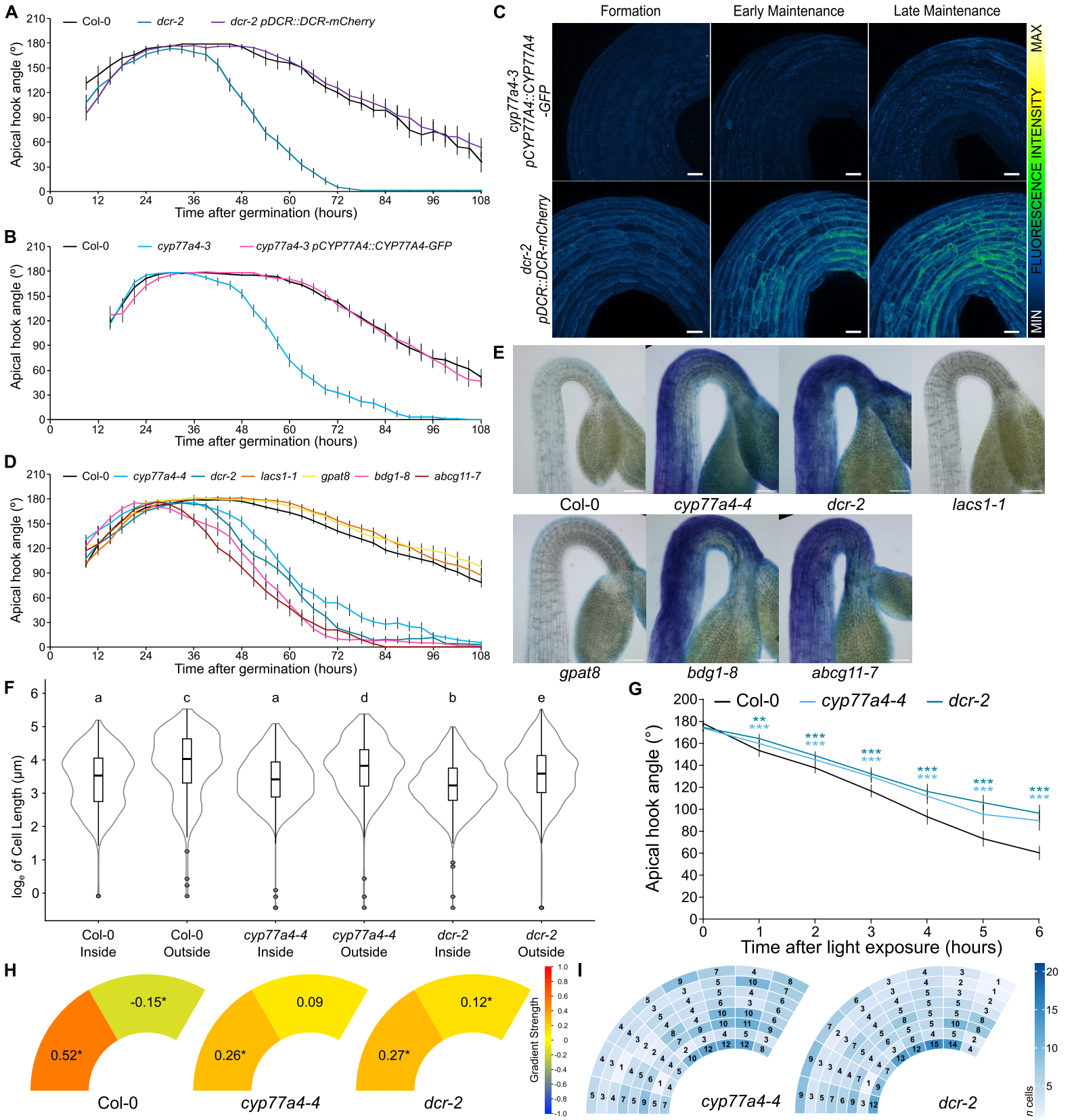

Figure S2. Cuticle integrity is essential for apical hook development. (A–B) Kinematics of mean apical hook angle in dark-grown Col-0 (n = 7 (A); 15 (B)), *dcr-2* (n = 14)and *dcr-2 pDCR::DCR-mCherry* (n = 15) (A) or *cyp77a4-3* (n = 15) and *cyp77a4-3 pCYP77A4::CYP77A4-GFP* (n = 17)(B). Error bars represent standard error of the mean. (C) Representative live confocal micrographs of dark-grown apical hooks of *cyp77a4-3 pCYP77A4::CYP77A4-GFP* and *dcr-2 pDCR::DCR-mCherry* in the formation (4–6 seedlings, 1 replicate), early maintenance (9–14 seedlings, 2 replicates) and late maintenance phases (14–15 seedlings, 3 replicates) (approximately 24, 36 and 48 hours after germination, respectively). Scale bars represent 20 µm. Increasing fluorescence intensity is color-coded according to the scale shown. (D) Kinematics of mean apical hook angle in dark-grown Col-0 (n = 70), *cyp77a4-4* (n = 25) *dcr-2* (n = 25), *lacs1-1* (n = 25), *gpat8* (n = 25), *bdg1-8* (n = 25) and *abcg11-7* (n = 11). Error bars represent standard error of the mean. (E) Representative light micrographs of dark-grown upper hypocotyls and apical hooks of the lines shown in (D) in the maintenance phase (48 hours post-germination) after toluidine blue staining. 3–14 seedlings were stained across 2 replicates. Scale bars represent 50 µm. (F) Box and violin plots of the natural logarithm of cell length for each domain shown, in apical hooks stained with PI in Col-0, *cyp77a4-4* and *dcr-2* backgrounds at approximately 48 hours after germination. 900–1600 cells per genotype were measured over at least three biological replicates. Different letters indicate statistically significant differences based on a non-parametric Kruskal-Wallis followed by Dunn's *post hoc* tests (α = 0.05). n = 563, 364, 775, 518, 931, 745 for Col-0 Inside, Outside; *cyp77a4-4* Inside, Outside; *dcr-2* Inside, Outside. Box plots show the median (centre line), the IQR (inter-quartile range) (box: 25th to 75th percentiles) and whiskers extending to the most extreme values within 1.5 × IQR.(G) Kinematics of apical hook angle in dark-grown Col-0, *cyp77a4-4* and *dcr-2* upon treatment with light, as measured every 1 hour, with 0 hour as the time point of light exposure. Seedlings were light-treated at 24 hours post-germination. The means of 20 seedlings per line are shown; error bars represent standard error of the mean. Asterisks indicate significant difference of *cyp77a4-4* (light blue) or *dcr-2* (dark blue) to Col-0 according to the Student's t-test (**P < 0.01, ***P < 0.001). (H) Schematics representing apical and basal elongation gradient strength in Col-0, *cyp77a4-4* and *dcr-2*, expressed as the difference between estimated mean strains in the inner and outer domains. A positive value indicates that the inner domain has a higher strain than the outer domain and *vice-versa*. Asterisks represent significant differences in average longitudinal strain in comparisons between inner and outer domains. A linear model with interaction effects between genotypes and domains was used for a pairwise comparison followed by a Dunn-Šidák correction (α = 0.05). (I) Exact n for positional bins represented in Figure 2G