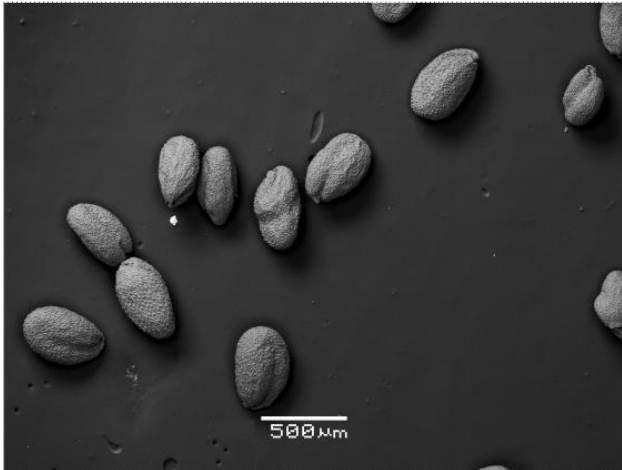


Table S1: T-DNA insertion lines and corresponding WT used in the work

Stocks	Mutated gene	Locus	Germplasm	Lab origin	Publication origin	Link source
Ws-2				Tamara Western lab, Montreal (CA)		
<i>bx11-1</i>	<i>BXL1</i>	AT5G49360	CS16299	Tamara Western lab, Montreal (CA)	Arsovski <i>et al.</i> , 2009	<a href="https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2705025/">https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2705025/</a>
Col-0				Own lab, Milan (IT)		
<i>cesa5-2</i>	<i>CESA5</i>	AT5G09870	SALK_023353	Chris Somerville lab, Stanford (USA)	Persson <i>et al.</i> , 2007	<a href="https://pubmed.ncbi.nlm.nih.gov/17878302/">https://pubmed.ncbi.nlm.nih.gov/17878302/</a>
<i>fei2-2</i>	<i>FEI2</i>	AT2G35620	CS2106721-SALK_044226	Joe Kieber lab, Chapel Hill (USA)	Harpaz-Saad <i>et al.</i> , 2012	<a href="https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3405700/">https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3405700/</a>
<i>fly1.1</i>	<i>FLY1</i>	AT4G28370	CS67936	George Haughn lab, Vancouver (CA)	Voiniciuc <i>et al.</i> , 2013	<a href="https://pubmed.ncbi.nlm.nih.gov/23482858/">https://pubmed.ncbi.nlm.nih.gov/23482858/</a>
<i>fly1.3</i>	<i>FLY1</i>	AT4G28370	SALK_144822	George Haughn lab, Vancouver (CA)	Voiniciuc <i>et al.</i> , 2013	<a href="https://pubmed.ncbi.nlm.nih.gov/23482858/">https://pubmed.ncbi.nlm.nih.gov/23482858/</a>
<i>gl2-8</i>	<i>GL2</i>	AT1G79840	SALK_130213C	NASC collection, Nottingham (UK)	Western <i>et al.</i> , 2004	<a href="https://pubmed.ncbi.nlm.nih.gov/14701918/">https://pubmed.ncbi.nlm.nih.gov/14701918/</a>
<i>luh-3</i>	<i>LUH/MUM1</i>	AT2G32700	SALK_107245C	NASC collection, Nottingham (UK)	Saez-Aguayo <i>et al.</i> , 2013	<a href="https://academic.oup.com/plcell/article/25/1/308/6097743">https://academic.oup.com/plcell/article/25/1/308/6097743</a>
<i>per36-1</i>	<i>PER36</i>	AT3G50990	SAIL_194_G03	Ikuko Hara-Nishimura lab, Kyoto (JP)	Kunieda <i>et al.</i> , 2013	<a href="https://academic.oup.com/plcell/article/25/4/1355/6100529">https://academic.oup.com/plcell/article/25/4/1355/6100529</a>
<i>pmei6-1</i>	<i>PMEI6</i>	AT2G47670	SM3.19557	Helen North lab, Versailles (FR)	Saez-Aguayo <i>et al.</i> , 2013	<a href="https://academic.oup.com/plcell/article/25/1/308/6097743">https://academic.oup.com/plcell/article/25/1/308/6097743</a>
<i>stk-2</i>	<i>STK</i>	AT4G09960		Own lab, Milan (IT)	Pinyopich <i>et al.</i> , 2003	<a href="https://pubmed.ncbi.nlm.nih.gov/12840762/">https://pubmed.ncbi.nlm.nih.gov/12840762/</a>

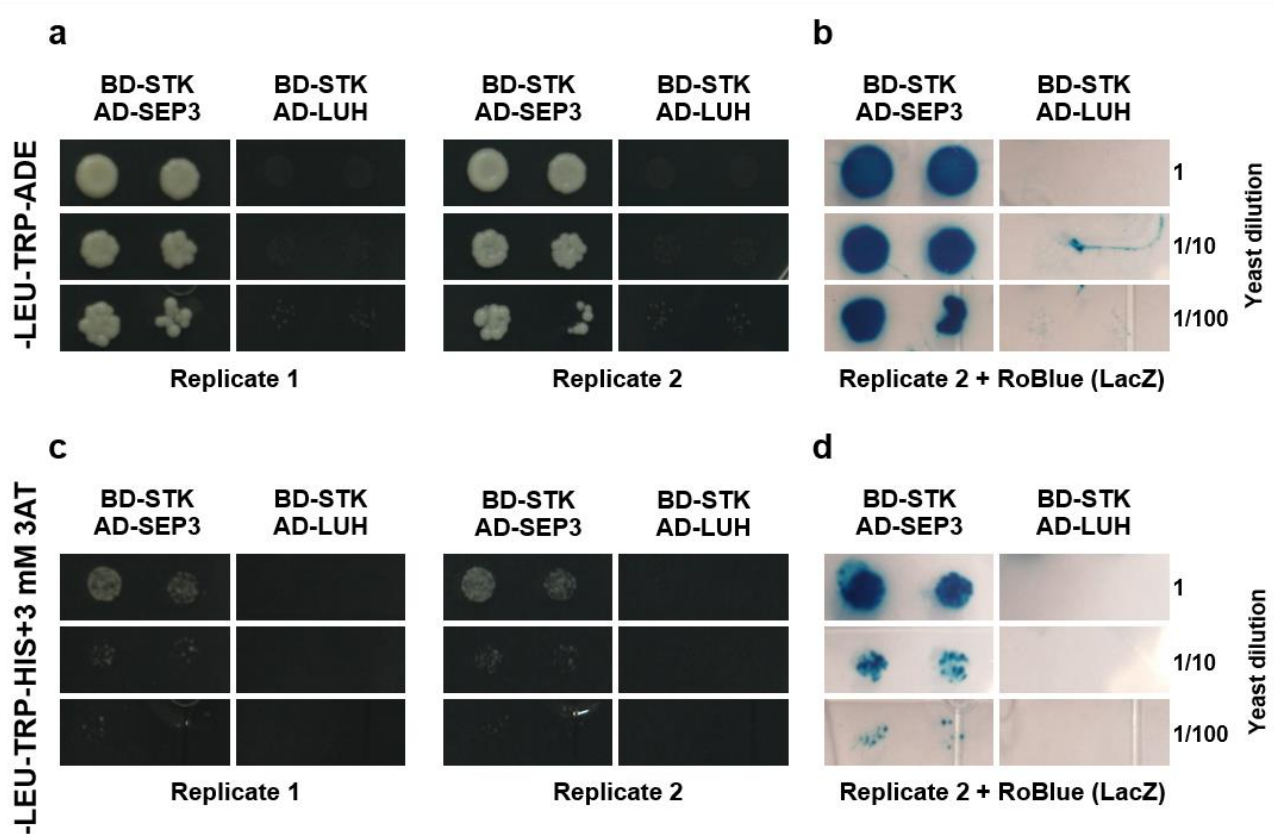
**Col-0**



***luh stk***



Figure S1: **Scanning Electron Microscopy (SEM) pictures of seeds from Columbia (WT) and *luh stk* double mutant.** In *luh stk* image normal arrows indicate WT-like seeds, dotted arrow indicate seeds with “wrinkled” phenotypes. Scale bar = 500 μm.



**Figure S2: Yeast Two-Hybrid assay to test the LUH-STK protein interaction.** The direct interaction between STK and LUH was tested using a yeast two-hybrid assay. The interaction STK-SEPALLATA 3 (SEP3) was used as a positive control. Two different colonies were used for the experiments with one technical replicate. Three yeast dilutions were used for the inoculation on the interaction media. The picture shows yeast growth seven days after inoculation and incubation at 22°C.

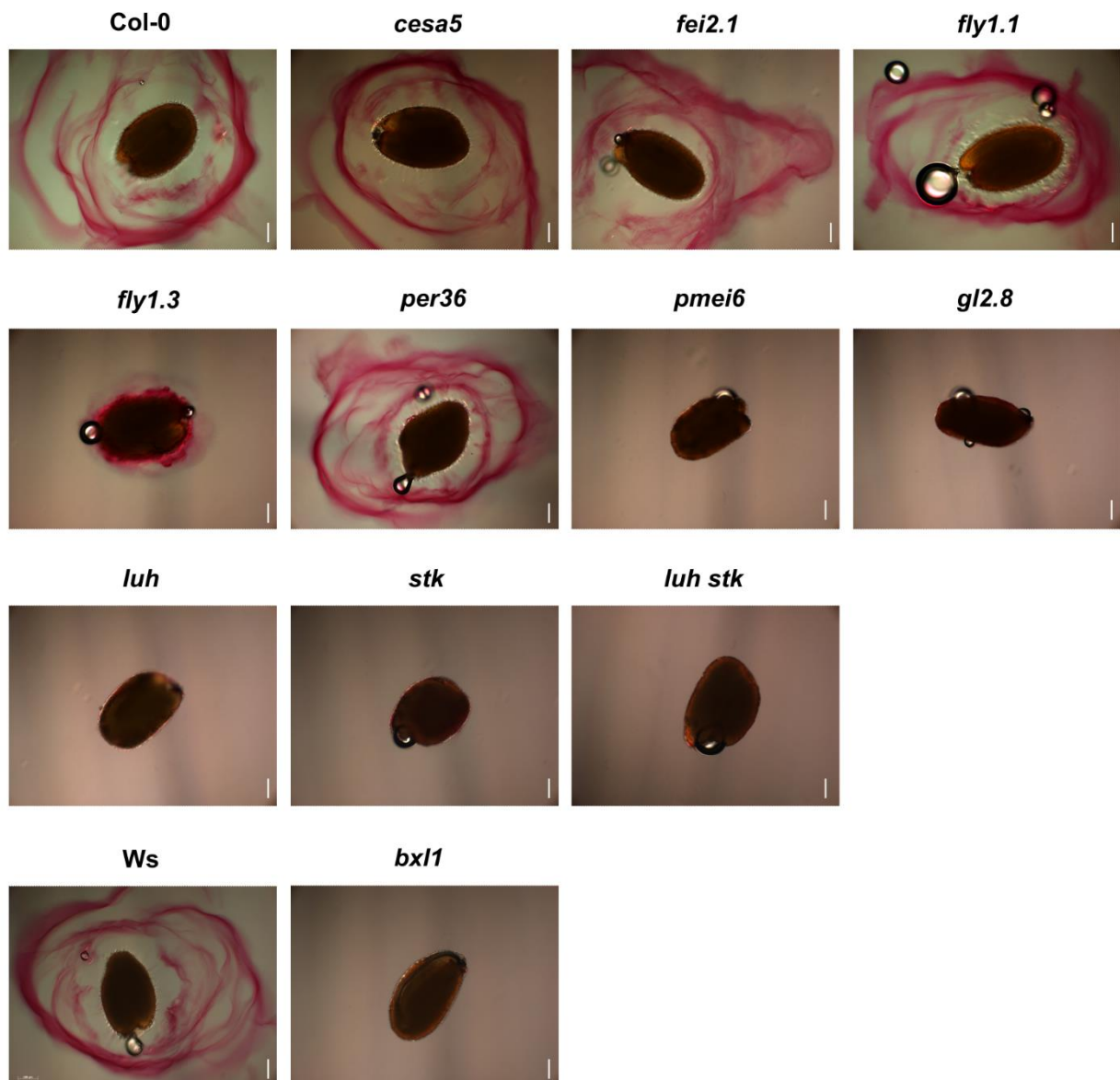


Figure S3: **Ruthenium red staining in seeds from the cell wall mutants for the mucilage extrusion analysis.** Stereomicroscope images of *cesa5*, *fei2.1*, *fly1.1*, *fly1.3*, *per36*, *pmei6*, *gl2.8*, *luh*, *stk*, *luh stk* and *bxl1* compared to the corresponding WT (Col-0 and Ws). Scale bar = 100  $\mu$ m;

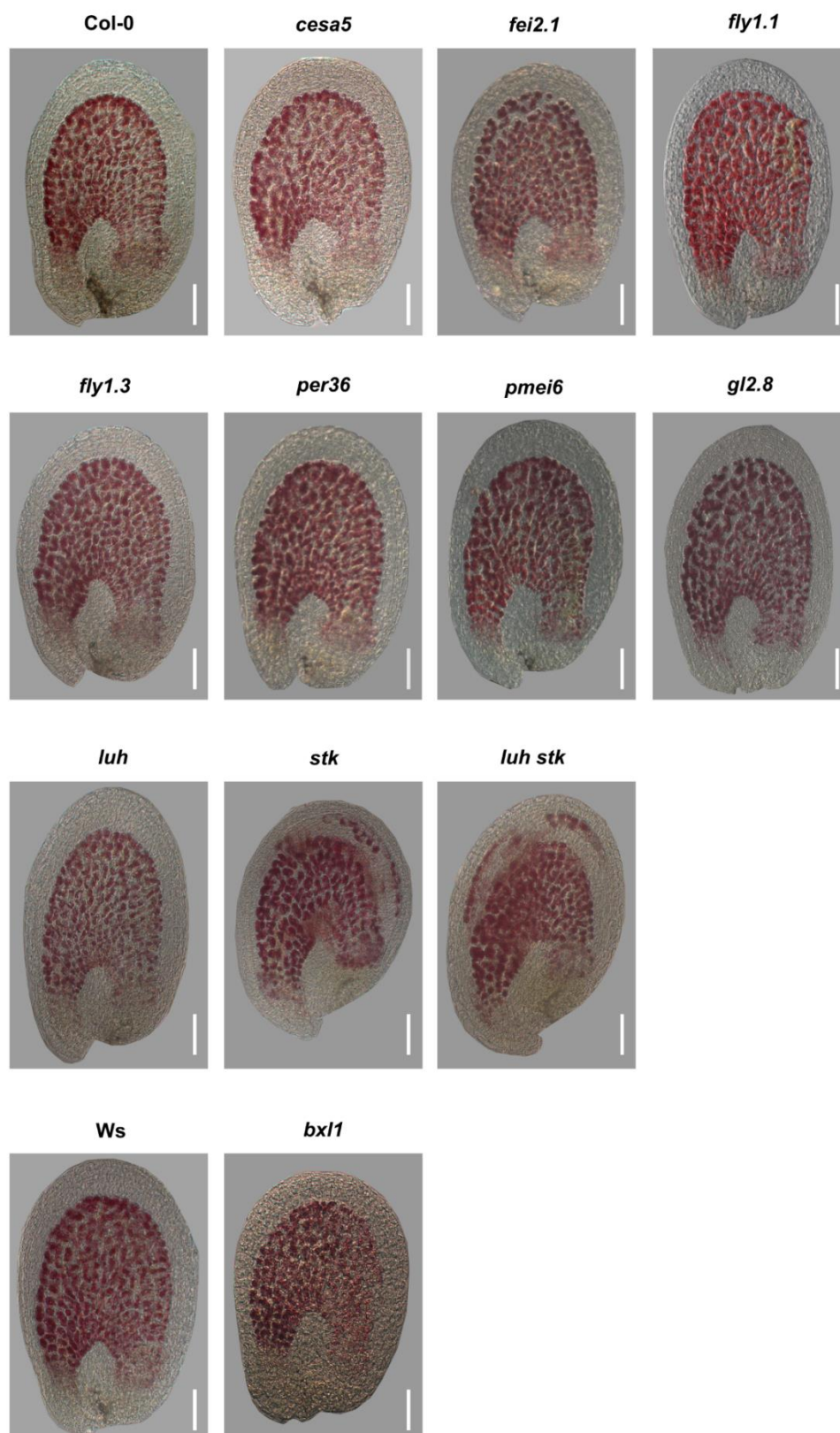


Figure S4: **Vanillin staining in seeds from the cell wall mutants for the proanthocyanidin accumulation analysis.** Microscope images of *cesa5*, *fei2.1*, *fly1.1*, *fly1.3*, *per36*, *pmei6*, *gl2.8*, *luh*, *stk*, *luh stk* and *bxl1* compared to the corresponding WT (Col-0 and Ws). Scale bar = 50  $\mu$ m.