

Supplemental Table S1: Gene and protein information

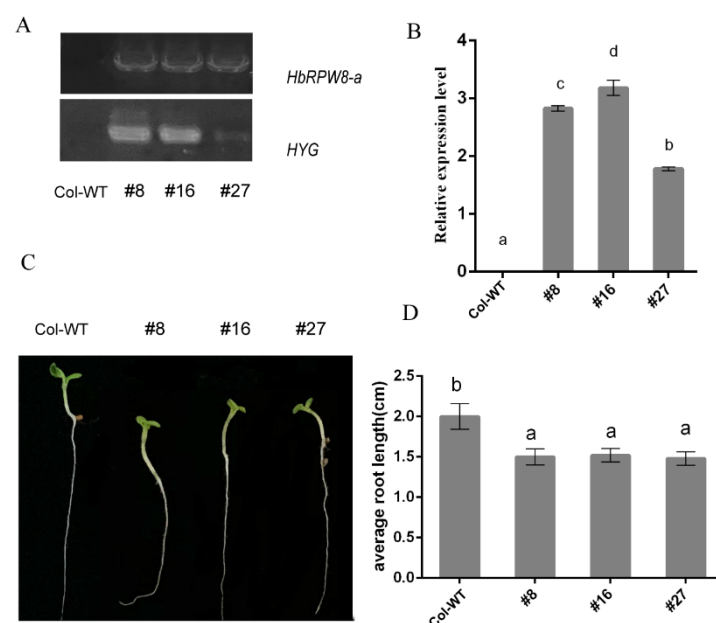
Genes	Assesion	ORF lenth (bp)	Number of exon	Number of intron	Number of AA	Molecular weight(D)	Theoretical pI hydropathicity
<i>HbRPW8-a</i>	XM_021812317.1	570	1	0	189	21728.51	9.23
<i>HbRPW8-b</i>	XM_021802913.1	2427	5	4	808	90347.87	5.77
<i>HbRPW8-c</i>	XM_021802915.1	2454	5	4	817	91902.35	5.92
<i>HbRPW8-d</i>	XM_021812335.1	2457	1	0	818	92820.43	6.41

Supplemental Table S2: Primers used in this study

primer name	Primers sequence (5'→3')	Description
<i>HbRPW8-a</i> qRT-F	GAAGATCTTCAAGCTAGATTGTTCATAGC	qRT-PCR
<i>HbRPW8-a</i> qRT-R	GGACTAGTCCCCAAAAGCGAATTCTAAGCA	
<i>HbRPW8-b</i> qRT-F	CCAAGGAGTGTTACATGGACCTA	qRT-PCR
<i>HbRPW8-b</i> qRT-R	TACCAATAGCCTCTTCTGTGCT	
<i>HbRPW8-c</i> qRT-F	CCAAGGAGTGTTACATGGACCTA	qRT-PCR
<i>HbRPW8-c</i> qRT-R	CCTGAGCTGCTTTGAATGATAG	
<i>HbRPW8-d</i> qRT-F	ATGTGGGCAGAACTGTATGAACT	qRT-PCR
<i>HbRPW8-d</i> qRT-R	AAGAAATCGGGTAACTGTAGGT	
<i>Hb18s</i> -F	CCTTACTACTTGGATAACCGTGG	qRT-PCR (internal reference gene)
<i>Hb18s</i> -R	CATCGAAAGTTGATAGGGCAG	
<i>AtRPW8.2</i> -F	ATGATTGCTGAGGTTGCCGCAG	For <i>AtRPW8.2</i> transient expression
<i>AtRPW8.2</i> -R	AGAATCATCACTGCAGAACGTAAATCG	
<i>AtActin2</i> -F	AGTGTCTGGATCGGTGGTTC	qRT-PCR (internal reference gene)
<i>AtActin2</i> -R	AAAGGCTTAAAAAGCTGGGG	
<i>HbRPW8-a</i> -F	ATGGAAATGGCTGAAGAGGC	For <i>HbRPW8-a</i>
<i>HbRPW8-a</i> -R	CCAAAAGCGAATTCTAAGCATT	overexpression

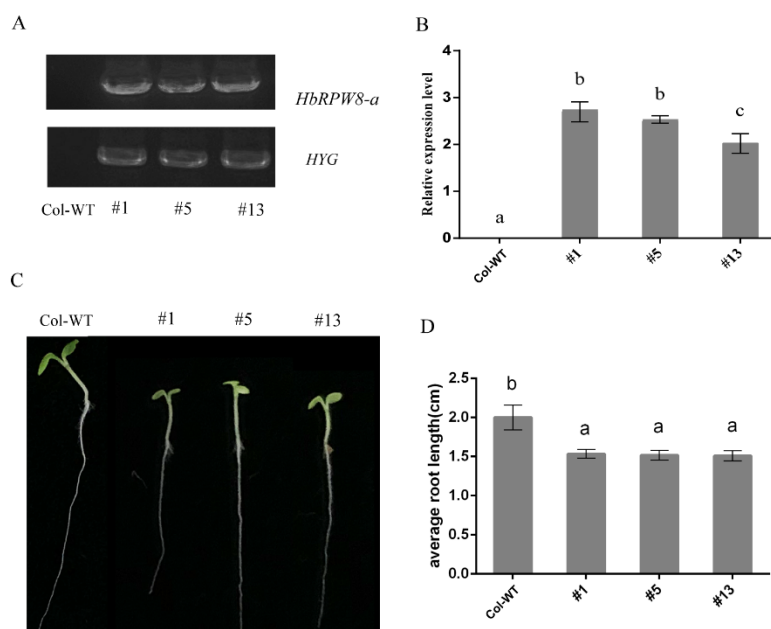
Supplemental Table S3: The accession numbers of various RPW8 gene

Species	Gene	Assesion/ Gene number	pfam domain (HMMER)	Reference
<i>Vitis pseudoreticulata</i>	<i>VpRPW8-a</i>	KU365990	RPW8-NR-ARC-LRR	[41]
	<i>VpRPW8-b</i>	KU365991	RPW8-NR-ARC-LRR	
	<i>VpRPW8-c</i>	KU365992	RPW8-NR-ARC-LRR	
	<i>VpRPW8-d</i>	KX389173	RPW8-NR-ARC,	
	<i>VpRPW8-e</i>	KX389175	RPW8-NR-ARC-LRR	
<i>Brassica napus</i>	<i>HRa</i>	KF906142	RPW8	[40]
	<i>HRb</i>	KJ476911		
	<i>HRc</i>	KJ476927		
	<i>HRd</i>	KJ476940		
<i>strawberry</i> ( <i>Fragaria</i> <i>×ananassa Duchase</i> )	<i>RPW8</i>	mrna24125.1-v1.0-hybrid	RPW8-NB-ARC	[42]
		mrna28370.1-v1.0-hybrid	RPW8-(NB-ARC)2	
		mrna08419.1-v1.0-hybrid	NB-ARC-RPW8	
		mrna28348.1-v1.0-hybrid	(NB-ARC)2 CC RPW8	
		mrna24108.1-v1.0-hybrid	RPW8 NB-ARC, CC, Pkinase_Tyr- Pkinase	
		mrna19978.1-v1.0-hybrid	NB-ARC, RPW8, zf-RING_2 (Ring finger domain)	
		mrna24089.1-v1.0-hybrid	RPW8-CC NB-ARC- Peptidase_C48	
<i>Cucurbita pepo L.</i>	<i>Cp4.1LG10g02780</i>	NOT found	RPW8- GRAM	[41]
	<i>Cp4.1LG10g02800</i>		RPW8	
	<i>Cp4.1LG10g02750</i>		RPW8-NR-ARC-LRR	
<i>Akebia trifoliata</i>	<i>AtNBS51</i>	NOT found	RPW8-NR-ARC-LRR	[62]
	<i>AtNBS49</i>			
	<i>AtNBS50</i>			
	<i>AtNBS52</i>			
<i>Lagenaria siceraria</i>	<i>Lsi01G010000.1</i>	NOT found	RPW8-NR-ARC-LRR	[63]
	<i>Lsi11G004730.1</i>			
	<i>Lsi04G015960.1</i>			



Supplemental Figure S1. Phenotypes of *Arabidopsis* transgenic lines with heterologous overexpression of *HbRPW8-a*

A Expressional analysis of the *HbRPW8-a* and positive control *Hygromycin* genes (*HYG*), which was assembled in the plant expression vector used in this experiment to detect the presence of the expression vector in the plant, by reverse transcription polymerase chain reaction in the Col-WT, and transgenic lines. B Real-time quantitative PCR analysis of the relative expression levels of *HbRPW8-a* gene in *Arabidopsis* overexpression lines (#8, #16, #27) and Col-WT. C Representative image of *Arabidopsis* after initial growth in 1/2MS medium. D Average root length of Col-WT and transgenic lines (#8, #16, #27). Data represent the mean  $\pm$  standard deviation (SD) of three independent experiments. \* indicates the difference between the transgenic line and the Col-WT. ( $P < 0.05$ , t-test).

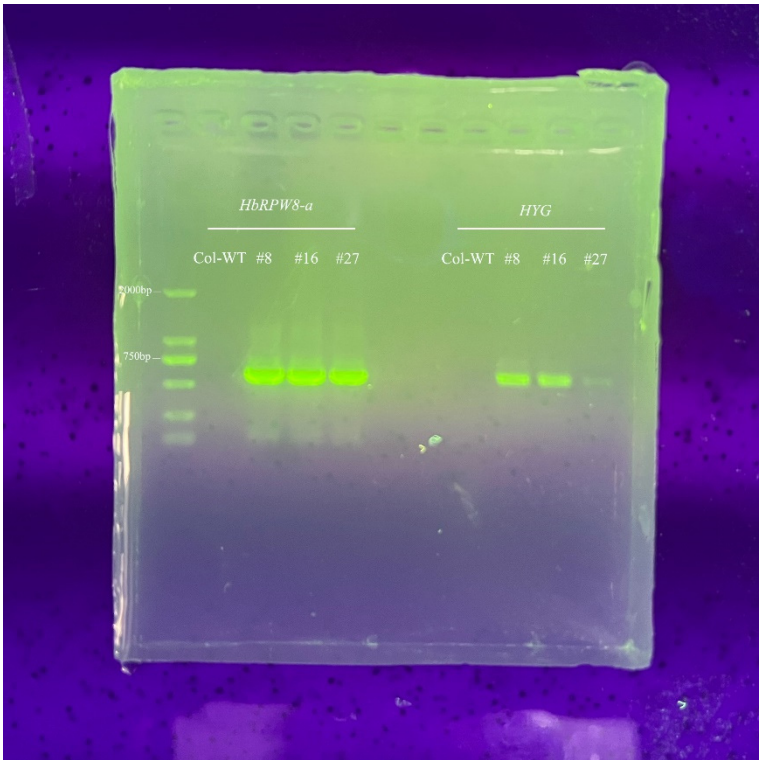


Supplemental Figure S2. Phenotypes of *HbRPW8-a* overexpressed lines at *NahG* background

A Expressional analysis of the *HbRPW8-a* and positive control *Hygromycin* genes (*HYG*), which was assembled in the plant expression vector used in this experiment to detect the presence of the expression vector in the plant, by reverse transcription polymerase chain reaction in the Col-WT, and transgenic lines. B Real-time quantitative PCR analysis of the relative expression levels of *HbRPW8-a* gene

in *Arabidopsis* overexpressing lines (#1, #5, #13) and Col-WT. C Representative image of *Arabidopsis* after initial growth in 1/2MS medium. D Average root length of Col-WT and transgenic lines (#1, #5, #13). Data represent the mean  $\pm$  standard deviation (SD) of three independent experiments. \* indicates the difference between the transgenic line and the Col-WT ( $P < 0.05$ , t-test).

The raw gel image of SF1



The raw gel image of SF2

