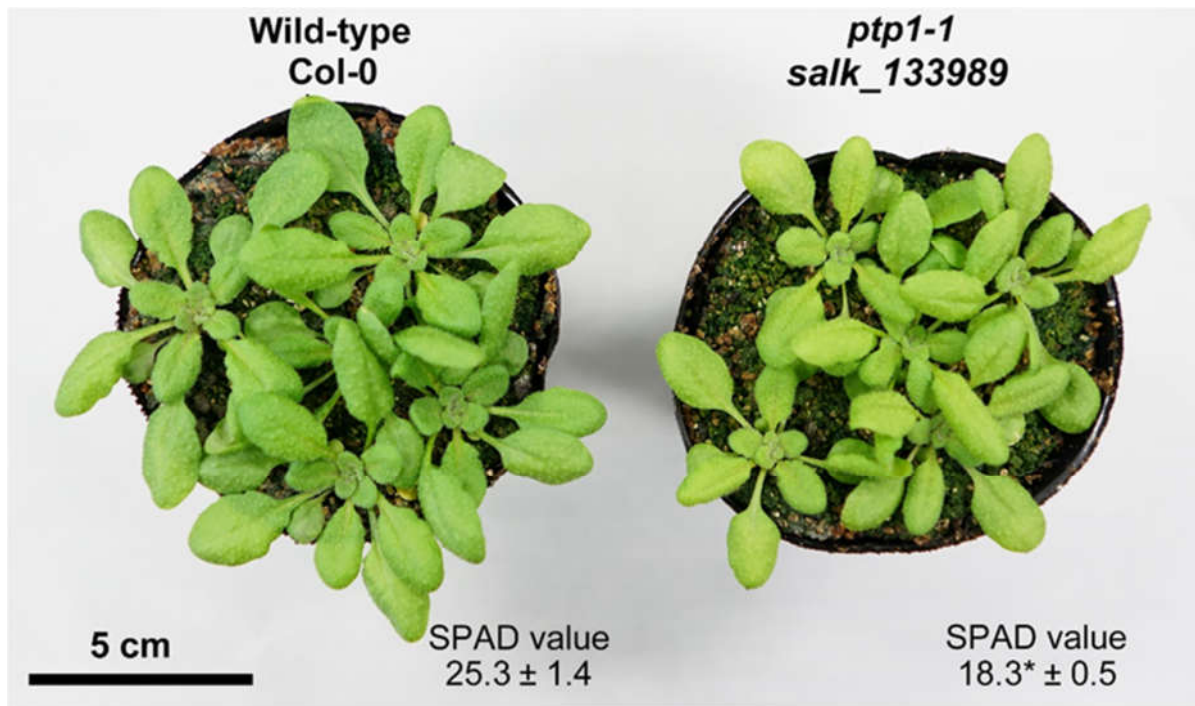
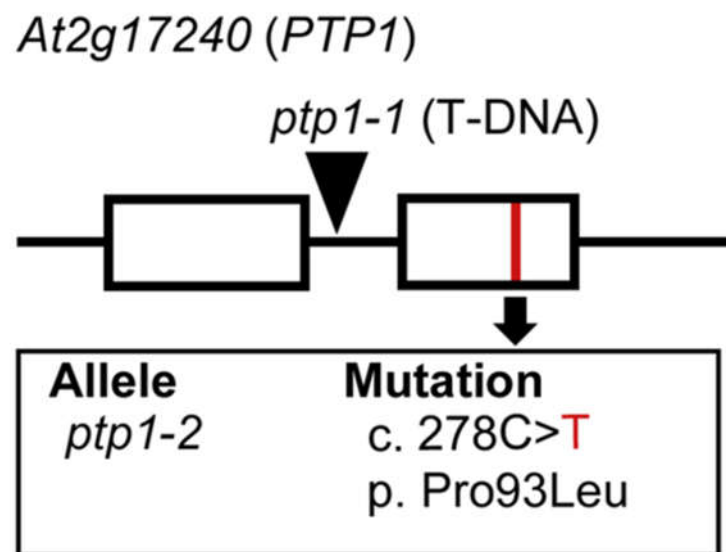


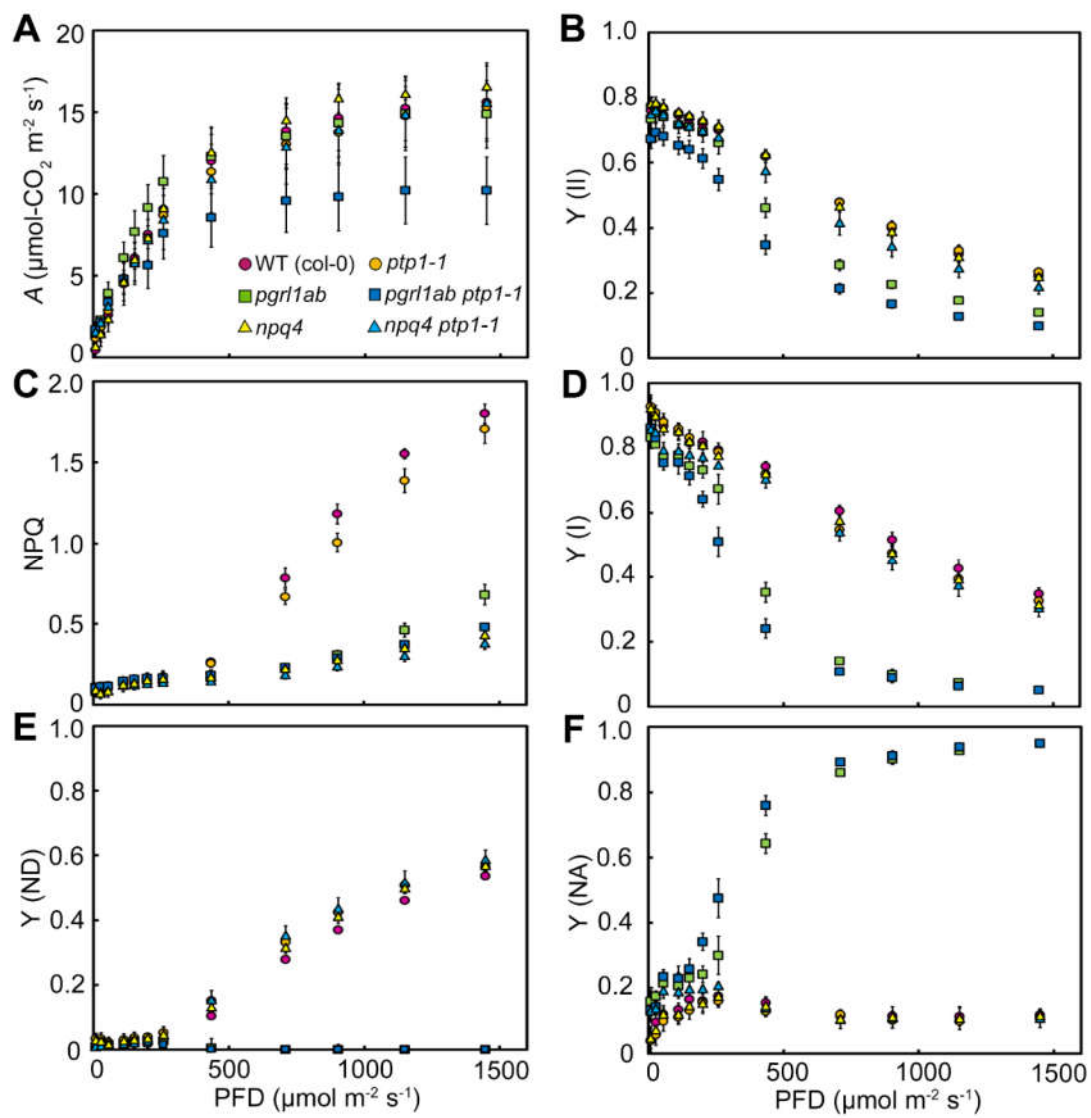
Supplementary Figure S1: *pgr5^{hope1}* screening method and mutation identification.

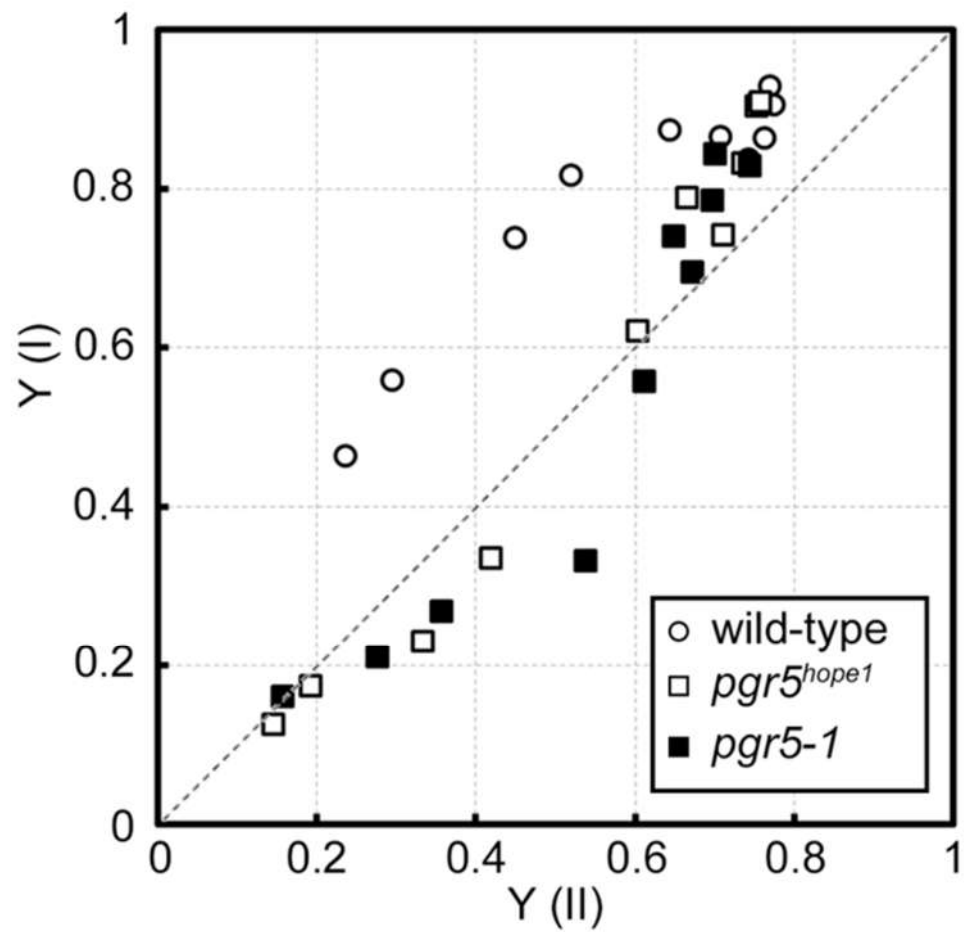


Supplementary Figure S2: The growth phenotype of *ptp1-1* (*salk_133989*) mutant.

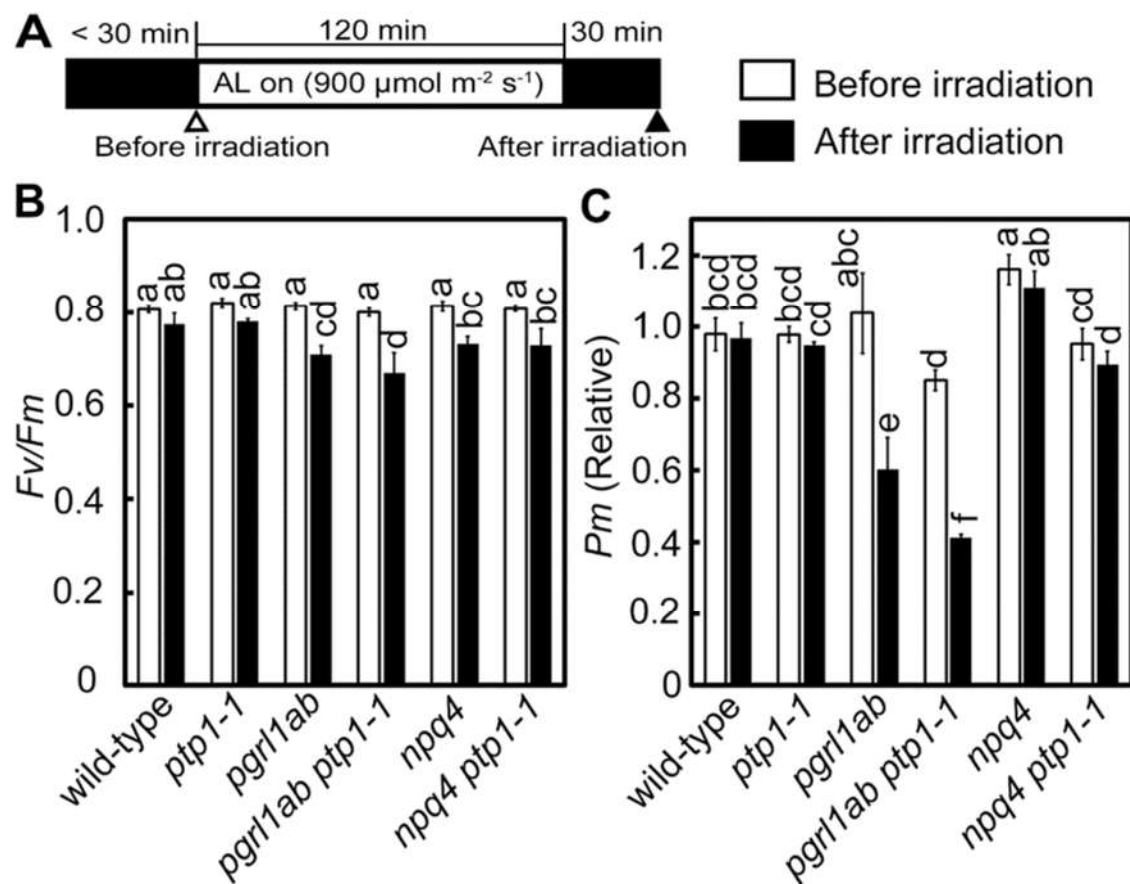


Supplementary Figure S3: The *PTP1* mutations in *ptp1-1* and *pgr5-1*.

Supplementary Figure S4: The photosynthesis capacity of *pgr1ab* and *pgr1ab ptp1* mutants.



Supplementary Figure S5: The extent of photoinhibition in PSII and PSI by constant intense light using *pgr1ab* and *pgr1ab ptp1* mutants.



Supplementary Figure S6: The relationship between Y(II) and Y(I) in wild-type, *pgr5^{hope1}* and *pgr5-1*.

Supplementary Table S2: Primer information used in this study.

Primer	Primer sequence	
SALK_133989_LP	GAAGGTTCTGAATTCGAAAGG	Specific primers for selection of <i>SALK_133989</i> mutant
SALK_133989_RP	ACTATCAAAACGCAACGCAG	
Forward primer for <i>pgr5</i> cloning	CACCATGGCTGCTGCTTCGATTCTG	Specific primers for <i>pgr5</i> cDNA cloning and insertion into D-TOPO entry clone
Reverse primer for <i>pgr5</i> cloning	CTAAGCAAGGAAACCAAGCCTC	
Forward primer for <i>ptp1</i> cloning	CACCATGGCGTCGCTTTGCTCTGC	Specific primers for <i>ptp1</i> cDNA cloning and insertion into D-TOPO entry clone
Reverse primer for <i>ptp1</i> cloning	CTATTGCTGCTTCTCGGGTTGTTT	

Supplementary Table S2: The relative amount of PGR5 protein in each mutant (per chlorophyll) The PGR5 protein was relatively quantified based on the results of immunoblotting. Each number shows the relative value when the wild-type (Col-0) is 1.0. Values are means \pm SD. ($n = 3$) n.d. indicates not detectable.

genotype	Relative amount of PGR5 protein per chlorophyll
Wild-type	
Col-0	1.0 \pm 0.2
gl-1	1.0 \pm 0.2
mutants	
<i>pgr5-1</i> (gl-1)	n.d.
<i>pgr5^{hope1}</i> (gl-1)	n.d.
<i>ptp1-1</i> (Col-0)	1.4 \pm 0.2
<i>pgr5-1 PGR5</i>	2.9 \pm 0.6
<i>pgr5^{hope1} PGR5</i>	2.7 \pm 0.5
<i>pgr1lab</i> (Col-0)	n.d.
<i>pgr1lab ptp1-1</i> (Col-0)	n.d.