

Expanded View Figures

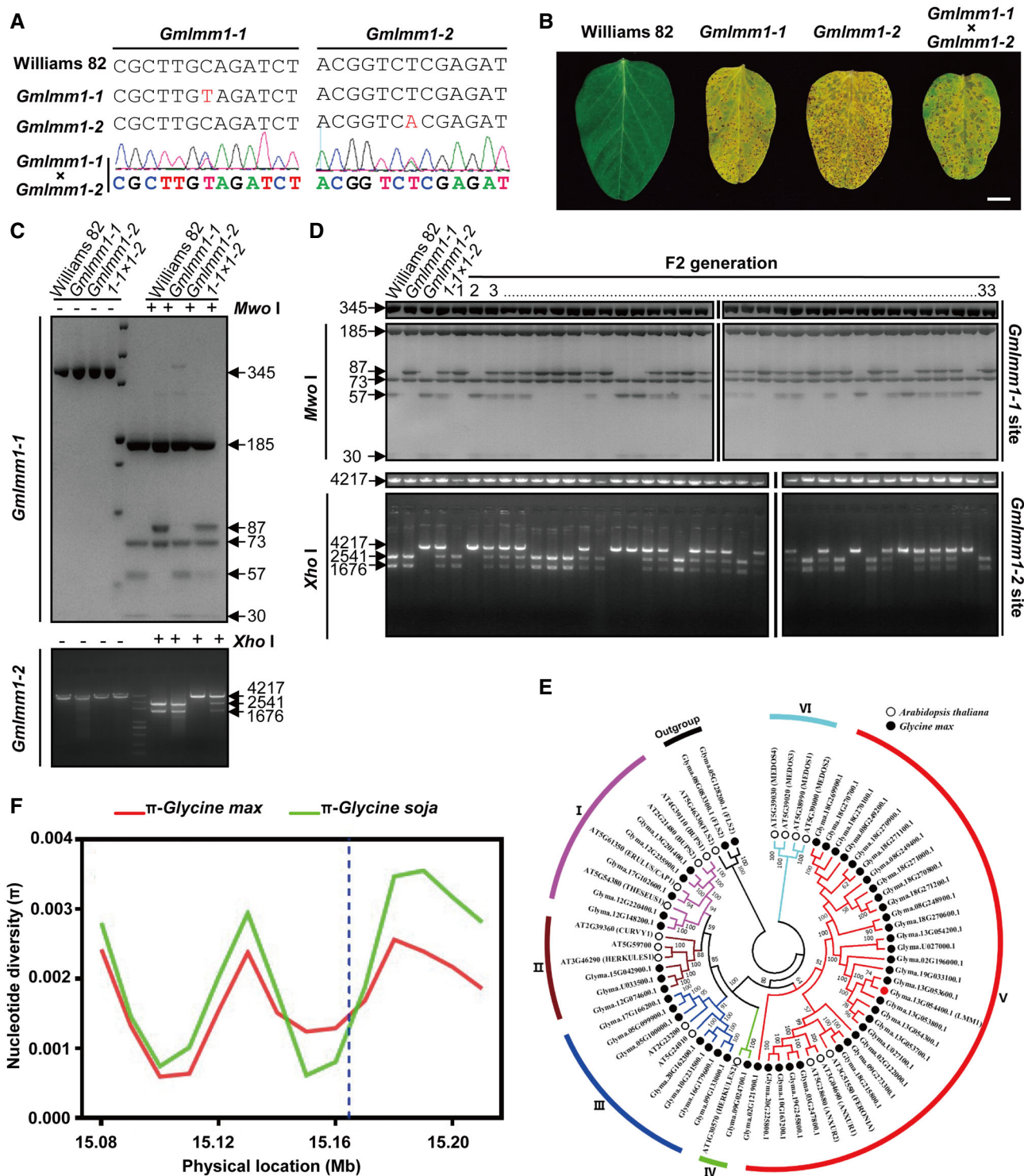


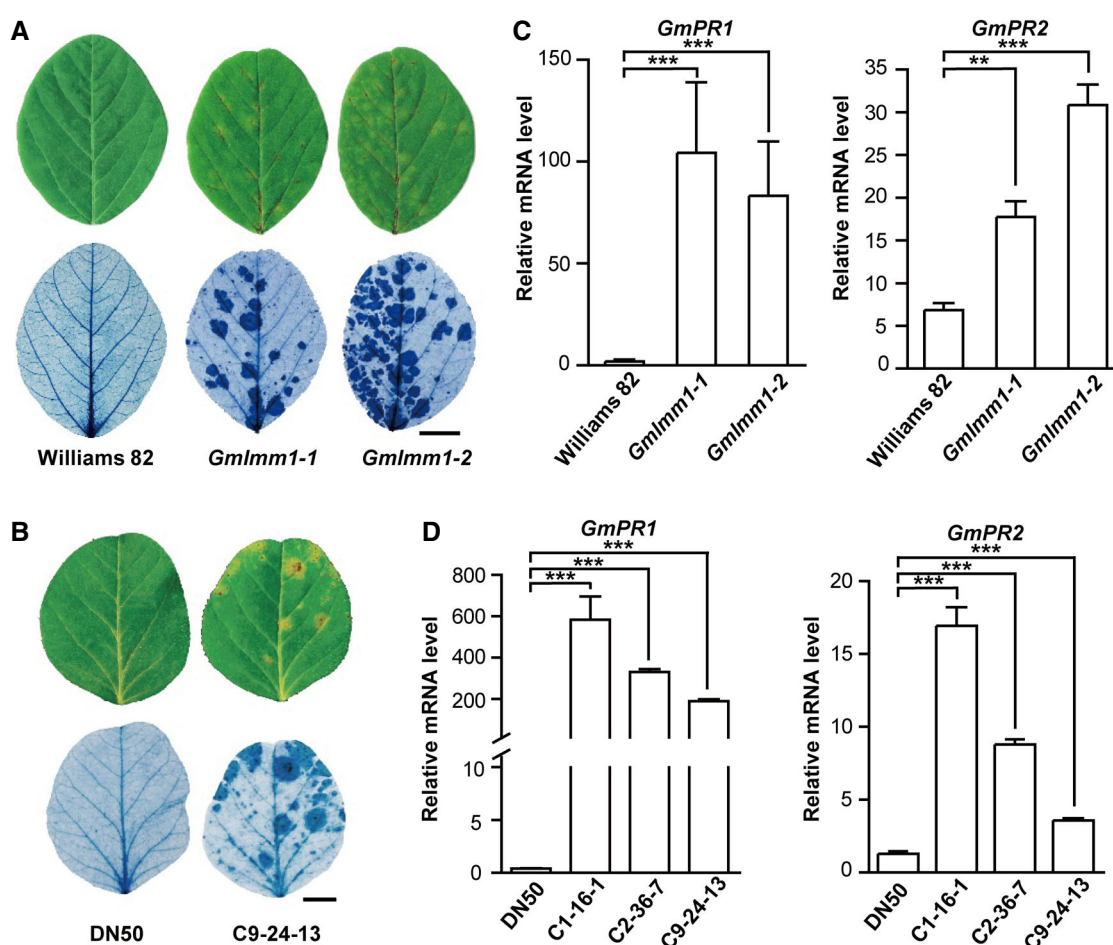
Figure EV1.

Figure EV1. Identification of the *Gmlmm1* mutants and bioinformatics analysis of the *GmLMM1* gene.

- A Verification of the mutation site of *Gmlmm1-1* and *Gmlmm1-2* by PCR and sequencing.
- B Typical phenotypes of the plants. The indicated plants were grown for 18 days in a climate chamber. Scale bar, 1 cm.
- C Identification of the F1 plant (*Gmlmm1-1* × *Gmlmm1-2*) genotype by PCR and restriction enzyme digestion. Fragments covering the *Gmlmm1-1* and *Gmlmm1-2* mutation sites were amplified by PCR, digested by the indicated enzymes, and separated on agarose gel. The corresponding fragment sizes after cleavage are marked with arrows.
- D Identification of the F2 (*Gmlmm1-1* × *Gmlmm1-2*) genotype. Total DNA was extracted from 33 individual F2 plants, and fragments covering the *Gmlmm1-1* and *Gmlmm1-2* mutation sites were amplified.
- E Phylogenetic analysis of the malectin-like RK family in *Arabidopsis* and *Glycine max*.
- F Nucleotide diversity (π) of *Glycine max* (red line) and *Glycine soja* (green line) across a ~150 kb genomic region that harbored the 13 mapped genes. The blue dotted line indicates the location of the *GmLMM1* gene. The abscissa represents the physical location (Mb) of differential nucleotides. The ordinate represents nucleotide diversity (π).

Data information: The experiments were performed three times (A, B) or two times (C, D), as biological replicates, with similar results.

Source data are available online for this figure.

**Figure EV2. *Gmlmm1* mutants are autoimmune-related lesion mimic mutants.**

- A Cell death examination in *Gmlmm1-1*, *Gmlmm1-2*, and Williams 82. Leaves of the indicated plants (aged 2 weeks) were subjected to trypan blue staining. Scale bar, 1 cm.
- B Cell death examination in DN50 (Dongnong 50) and the CRISPR line C9-24-13. Scale bar, 1 cm.
- C Expression of the defense marker genes in *Gmlmm1* mutants. *GmPR1* and *GmPR2* were examined by qPCR analysis in the indicated plants (Mean $\pm$ SD, ** P < 0.01, *** P < 0.001, Student's t -test).
- D Expression of *GmPR1* and *GmPR2* in DN50 and the CRISPR lines. (Mean $\pm$ SD, *** P < 0.001, Student's t -test).

Data information: The experiments were performed three times (A, B) or two times (C, D), as biological replicates, with similar results.

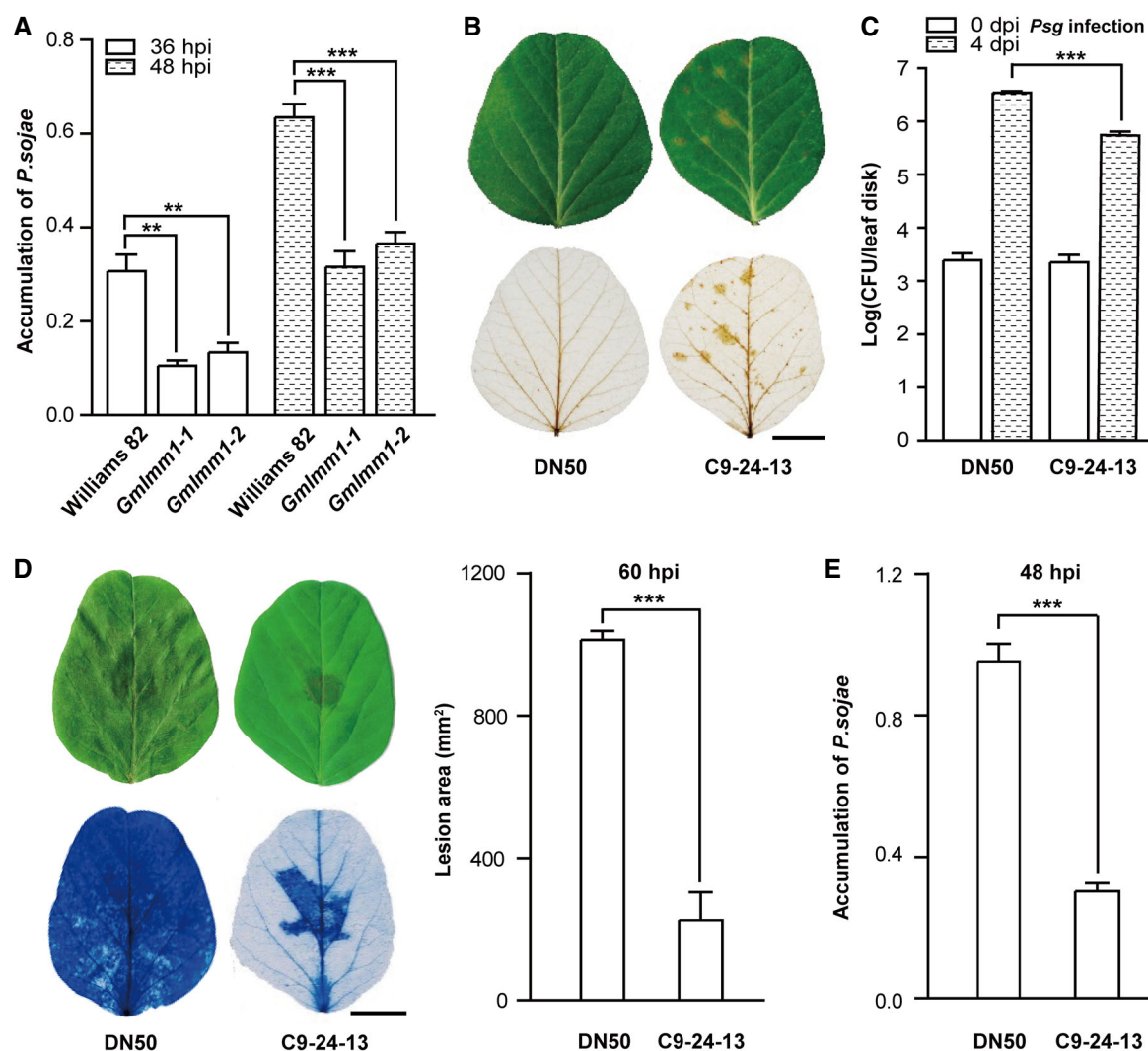


Figure EV3. The mutants are more resistant to *Psg* and *P. sojae*.

A Measurement of *P. sojae* biomass. (Mean $\pm$ SD, ** P < 0.01, *** P < 0.001, Student's *t*-test).

B ROS accumulation in DN50 and C9-24-13. Soybean leaves (aged 2 weeks) were subjected to ROS accumulation examination by DAB staining. Scale bar, 1 cm.

C The C9-24-13 line was more resistant to *Psg* infection. Scale bar, 1 cm. (Mean $\pm$ SD, $n \geq 8$, n represents sample number, *** P < 0.001, Student's *t*-test).

D The increased resistance of the C9-24-13 line to *P. sojae* infection. The indicated plants (aged 2 weeks) were infected with *P. sojae* isolate P7076, and lesions are shown by trypan blue staining at 60 hpi (left panel). Scale bar, 1 cm. The lesion areas were calculated and compared (right panel) (Mean $\pm$ SD, $n = 6$, n represents sample number, *** P < 0.001, Student's *t*-test).

E Measurement of *P. sojae* biomass (Mean $\pm$ SD, *** P < 0.001, Student's *t*-test).

Data information: All the experiments were performed three times (biological replicates) with similar results.

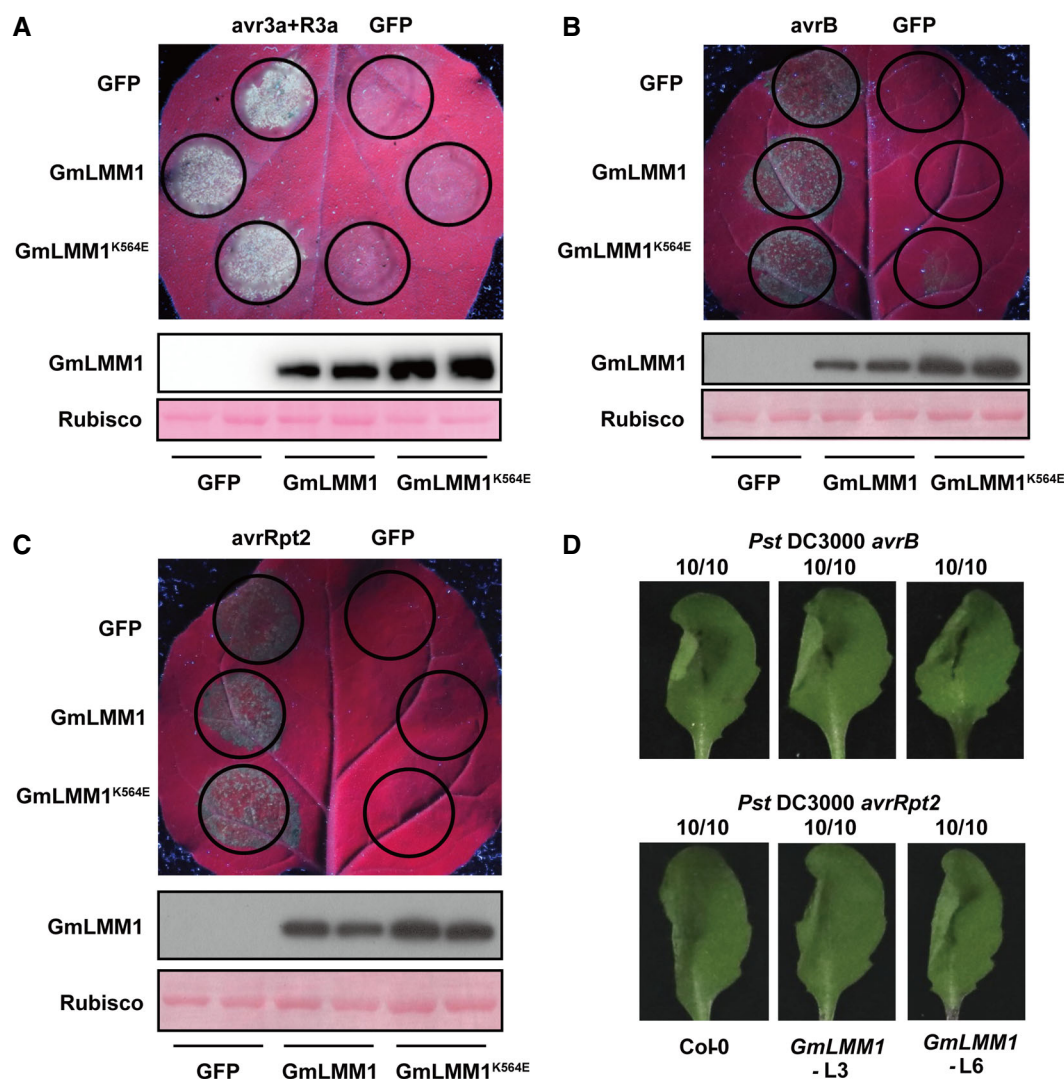


Figure EV4. Effect of GmLMM1 on effector-induced cell death.

- A** R3a and *avr3a*-induced cell death was not affected by GmLMM1. The indicated constructs were transiently expressed in *N. benthamiana* by *Agrobacterium*-mediated transient expression. The cell death phenotype was photographed under UV light. Protein expression of GmLMM1-HA and GmLMM1^{K564E}-HA is shown in the lower panel.
- B, C** *AvrB* (**B**) and *AvrRpt2* (**C**)-induced cell death was not affected by GmLMM1 in *N. benthamiana*. Protein expression of GmLMM1-HA and GmLMM1^{K564E}-HA is shown in the lower panel.
- D** *AvrB* and *AvrRpt2*-induced cell death was not affected by GmLMM1 in Arabidopsis. *P. syringae* DC3000 carrying *avrB* or *avrRpt2* was infiltrated into the left side of the transgenic leaves expressing the *GmLMM1* gene. Cell death was scored 3 hpi (*avrB*) and 8 hpi (*avrRpt2*). Numbers indicate the ratio of leaves developing cell death and total number of inoculated leaves.

Data information: The experiments were performed three times (A) or two times (B–D), as biological replicates, with similar results.

Source data are available online for this figure.

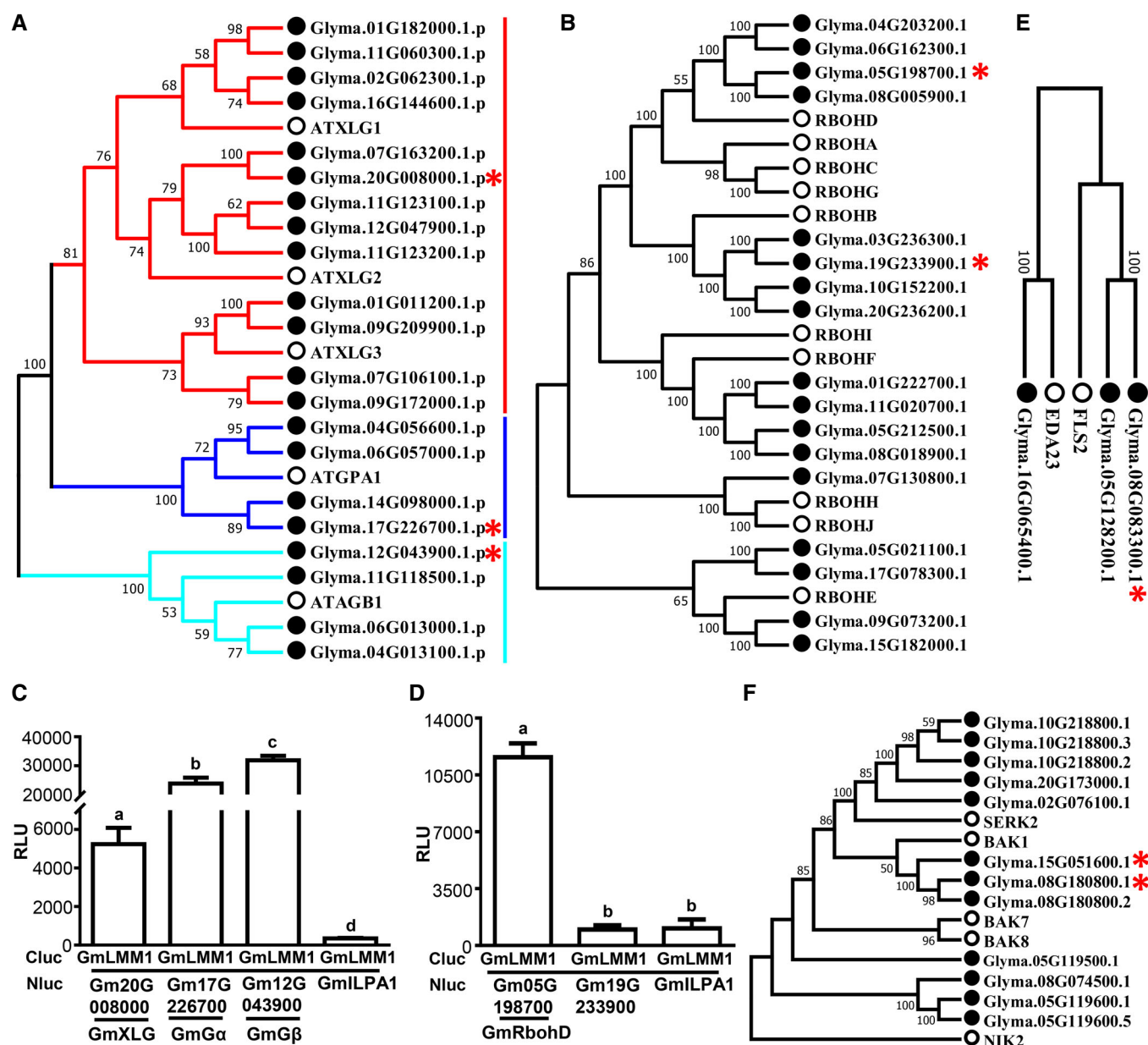


Figure EV5. GmLMM1 interacts with soybean G proteins and NADPH oxidases and phylogenetic analysis for homologs of Arabidopsis in soybean.

- A Phylogenetic analysis of homologs of Arabidopsis G proteins ($G\alpha$, $G\beta$, and extra large G protein) in soybean. The proteins used below (C) are marked by red asterisks.
- B Phylogenetic analysis of NADPH oxidases in Arabidopsis and soybean. The proteins the below (D) are marked by red asterisks.
- C GmLMM1 interacts with soybean G proteins. The indicated constructs were transiently expressed in *N. benthamiana* leaves and subjected to luciferase complementation assay. Gm20G008000 (GmXLG), Gm17G226700 (GmG α), and Gm12G043900 (GmG β) were determined (Mean $\pm$ SD, $n \geq 6$, n represents sample number, $P < 0.05$, Student's *t*-test, different letters indicate significant difference).
- D GmLMM1 interacts with soybean NADPH oxidases. The indicated constructs were transiently expressed in *N. benthamiana* leaves and subjected to luciferase complementation assay. Gm05G198700 (GmRbohD) is the closest homolog of Arabidopsis RbohD. Gm19G233900 is the closest homolog of Arabidopsis RbohB (Mean $\pm$ SD, $n \geq 6$, n represents sample number, $P < 0.05$, Student's *t*-test, different letters indicate significant difference).
- E Phylogenetic analysis of homologs of Arabidopsis FLS2 proteins in soybean. The proteins used in this study are marked by red asterisks.
- F Phylogenetic analysis of homologs of Arabidopsis BAK1 proteins in soybean. The proteins used in this study are marked by red asterisks.

Data information: The experiments (C, D) were performed three times (biological replicates).