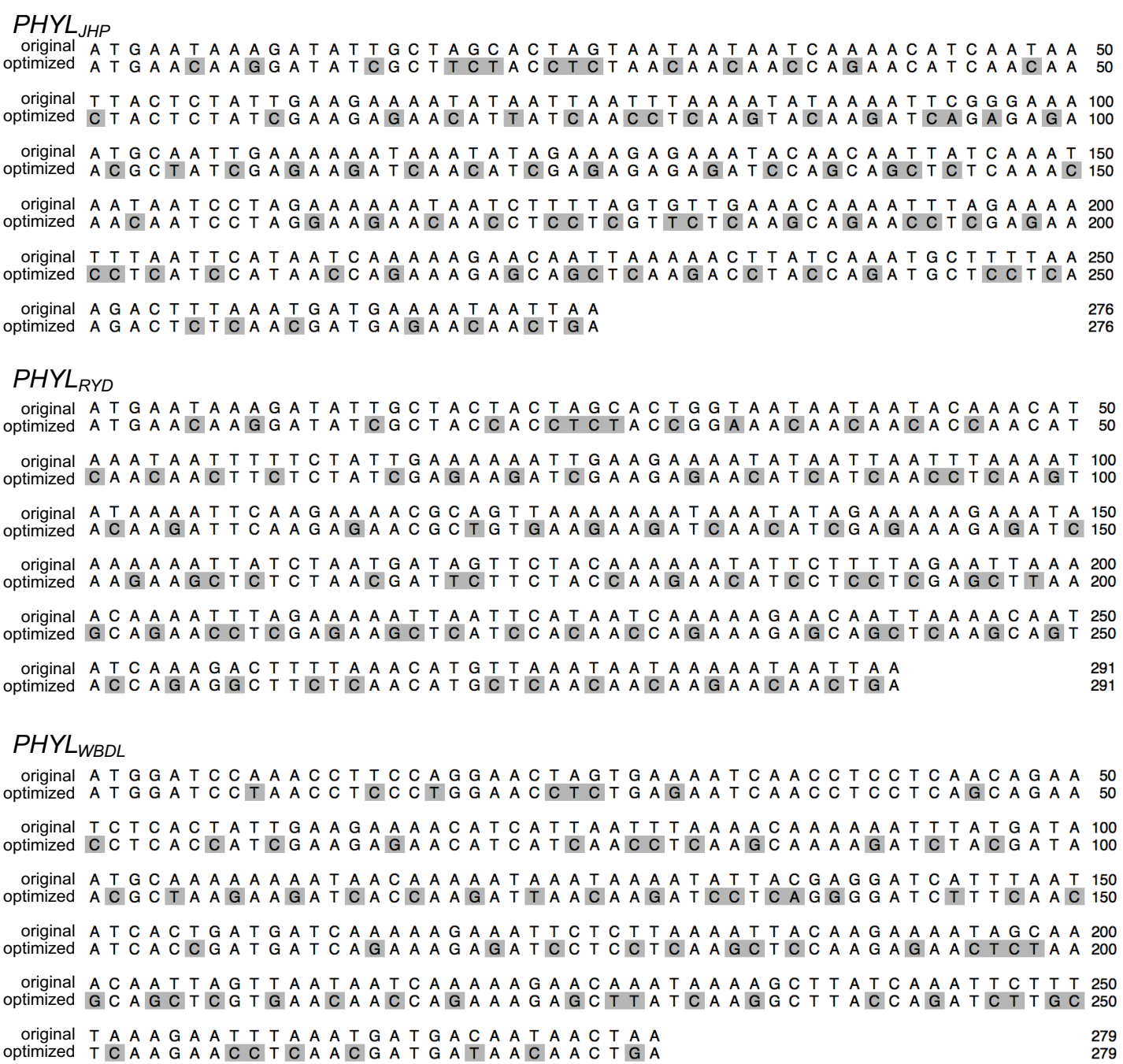
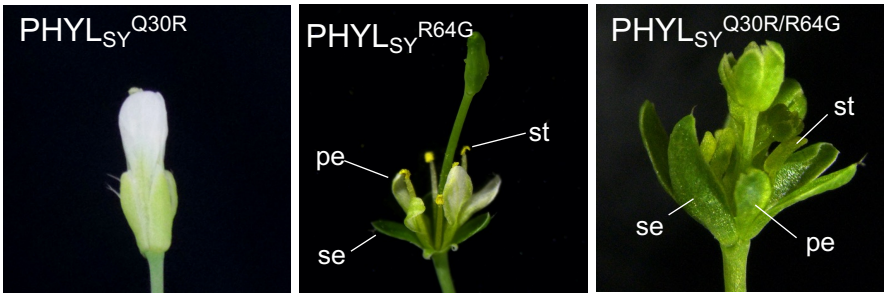
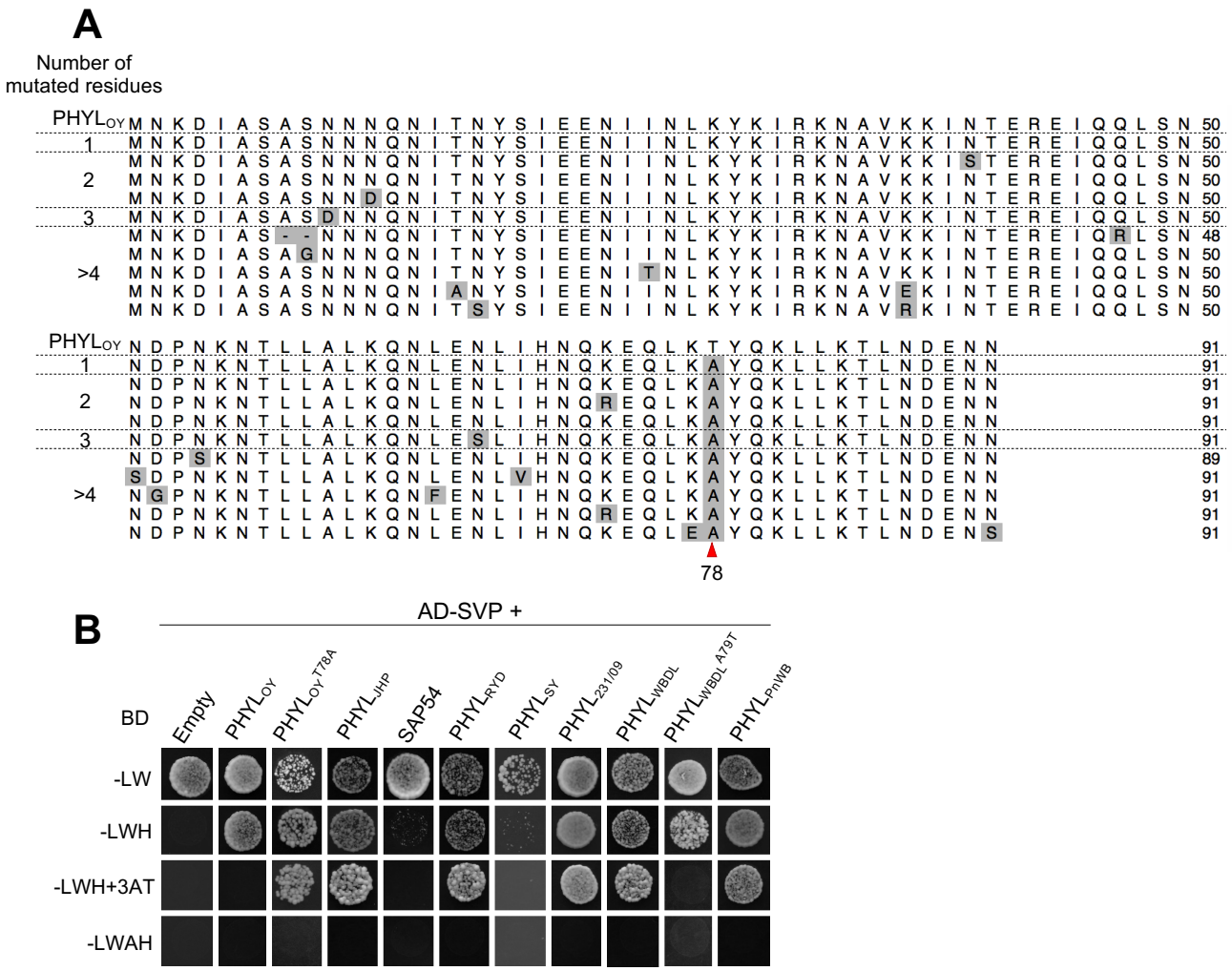


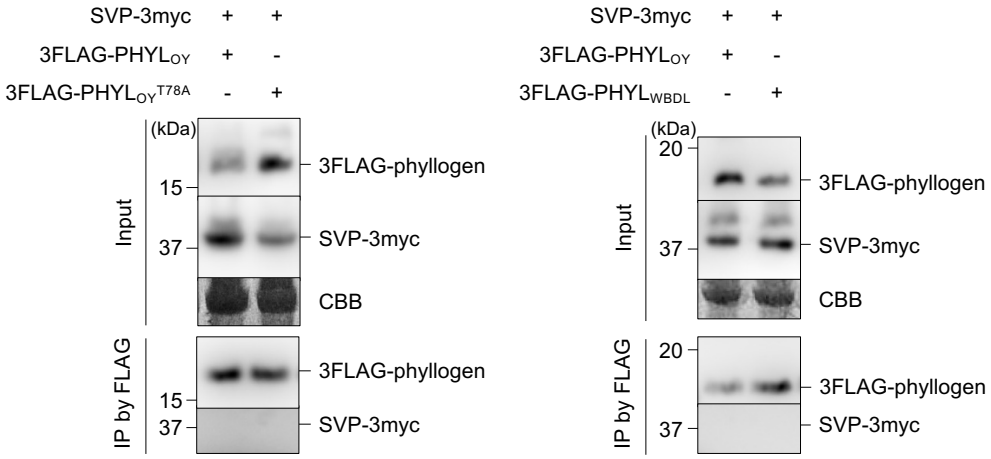
Supplementary Figure 1. Optimized nucleotide sequences of putative secreted regions of phyllogens cloned in the study. Optimized nucleotides were highlighted in gray.



Supplementary Figure 2. Effects of mutation Q30R and/or R64G in PHYL$_{SY}$. Floral phenotypes of *Arabidopsis thaliana* plants infected with the tobacco rattle virus (TRV) vector carrying PHYL$_{SY}$ mutants were shown. Sepals, petals, and stamens are indicated as (se), (pe), and (st), respectively.



Supplementary Figure 3. Interactions of phyllogens with SVP in yeast. **(A)** Alignment of the protein sequences of $PHYL_{OY}$ and the screened mutants excluding putative signal peptides. Sequences were aligned using the MUSCLE algorithm. Mutations were highlighted in gray. A red arrowhead indicates an interaction-involved mutation T78A, numbered based on amino acid sequences of $PHYL_{OY}$ without signal peptides. **(B)** Yeast two hybrid assay using SVP and $PHYL_{OY}$, $PHYL_{OY}^{T78A}$ and other phyllogen homologs. The experimental conditions were described in **Figure 1B**.



Supplementary Figure 4. Interactions of phyllogens with SVP *in planta* were not detected. Co-immunoprecipitation assays were performed using 3 × myc tag-fused SVP (SVP-3myc) and 3 × FLAG tag-fused PHYL$_{OY}$ (3FLAG-PHYL$_{OY}$) and either of its mutant (Left) or PHYL$_{WBDL}$ (Right). The experimental conditions were described in **Figure 2**.