



Fig. S 4 Regulation of *PTSp1* and *PTSp2* promoter activity by *HY5*. (a) Schematic representation of *PTSp1* and *PTSp2* promoters, indicating light responsiveness (yellow) and MeJA responsiveness (orange). (b) Overview of the experimental design for the dual-luciferase assay, including control vector (EV), effector vector (*PatHY5*), and reporter genes (*R-luc* and *F-luc*). (c) Bioluminescence imaging of *Nicotiana benthamiana* leaves co-transfected with *PTSp1* promoter and *PatHY5*, showing luminescence intensity distribution. (d) Comparison of luminescence intensity for *PTSp1* in the presence of *PatHY5*, presented as p/s/cm²/sr. (e) Relative *F-luc/R-luc* ratios for *PTSp1* with *PatHY5*. (f) Bioluminescence imaging of *N. benthamiana* leaves co-transfected with *PTSp2* promoter and *PatHY5*. (g) Luminescence intensity for *PTSp2* in the presence of *PatHY5*. (h) Relative *F-luc/R-luc* ratios for *PTSp2* with *PatHY5*. Statistical analysis was performed using Student's t-test. **p* < 0.05; ***p* < 0.01; ****p* < 0.001.