

Supplementary Material

Modulation of Cellular Redox Status by Thiamine-activated NADPH oxidase Confers *Arabidopsis* Resistance to *Sclerotinia sclerotiorum*

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Supplementary Figure Legends

Figure S1. Thiamine does not affect the growth of *Sclerotinia in vitro*. The effect of thiamine on the phenotype (A) and the growth rate (B) of *Sclerotinia*. Mycelia were cultured for 5 days on potato-dextrose agar plates with 1 mM thiamine. Mycelia diameters of *Sclerotinia* were determined with a caliper on a daily basis for up to 2 days. (C) Oxalate concentration in leaves infected with wild-type or A2 mutant *Sclerotinia*. Leaves of *Arabidopsis* were inoculated and incubated for 1.5 d with agar plugs containing wild-type (WT) or oxalate-deficient mutant (A2) *Sclerotinia*. Control was mock inoculated agar plugs without containing *Sclerotinia* mycelia.

Figure S2. Thiamine and its derivatives contents in auxotroph *tz-1 Arabidopsis*. (A) A small scheme showing the different steps in thiamine biosynthesis. (B) *tz-1* plants had low levels of thiamine compared with Col-0. The *tz-1* plants were grown in soil with thiamine under controlled concentrations (0.01%) for 4 weeks. (C) The levels of thiamine in *tz-1* plants were positive correlation with the culture's concentration. The *tz-1* plants were grown in soil contains 50 to 300 μM thiamine after germination on agar medium weekly with 0.01% thiamine. Data are means \pm SD of three independent experiments with similar results. Asterisks (*) indicate a significant difference from the Col-0 plant at $P < 0.05$ (student's t test); (**), student's t test significant at $P < 0.01$.

Figure S3. *In situ* detection of O_2^- formation at 2 days after *Sclerotinia* inoculation. (A) O_2^- accumulated surrounding the advancing edge of necrotic lesions. (B) The effect of thiamine on O_2^- generation in NOX mutants. The leaves of Col-0, *atrbohD* and *atrbohDF* were pretreated with thiamine prior to inoculation with wild-type *Sclerotinia*. Experiments were repeated at least three times, and a single typical experiment was shown.

Figure S4. Thiamine induced lignin accumulation in wild-type *Sclerotinia*-infected leaves. (A) Thiamine pretreatment induced lignin accumulation in leaves inoculated with wild-type *Sclerotinia*. Lignin was stained with phloroglucinol. Blue arrows indicate mycelium of

Sclerotinia. (B) Lignin content was measured the absorbance at 280 nm. Different letters indicate significant ($P < 0.05$) among treatments according to Duncan's Multiple Range Test.

Figure S5. The effect of thiamine on H_2O_2 generation in leaves inoculated with A2 mutant. Leaves were inoculated with A2 mutant at 4 h after spraying with $250 \mu\text{g mL}^{-1}$ Tween 80 (control) or 1 mM thiamine dissolved in $250 \mu\text{g mL}^{-1}$ Tween 80. The content of H_2O_2 was measured 3 h later. Values represent means \pm SD of three independent experiments. Letters a, b and c indicate significant differences ($P < 0.05$) among treatments according to Duncan's Multiple Range Test.

Figure S6. The effect of thiamine in cultivars of susceptible *B. napus* 'Yinong 34' and partially resistant 'Zhongshuang 9'. (A) Disease symptoms in *B. napus* 'Yinong 34' and 'Zhongshuang 9' after 36 h inoculated with *Sclerotinia*. (B) Statistical analysis of the lesion size in *B. napus* 'Yinong 34' and 'Zhongshuang 9'. Leaves of both varieties were infected with *Sclerotinia* grown on PDA and kept in a clear plastic box under saturating humidity at 20-22 °C. (C) Thiamine increased NOX activity in *B. napus* leaves challenged with wild-type *Sclerotinia* for 3 h. (D) Quantitative determination of H_2O_2 in cultivars 'Yinong 34' and 'Zhongshuang 9'. (E) Tissue defence responses induced by thiamine in *B. napus* 'Zhongshuang 9'. Letters a, b and c indicate significant differences ($P < 0.05$) among treatments according to Duncan's Multiple Range Test.

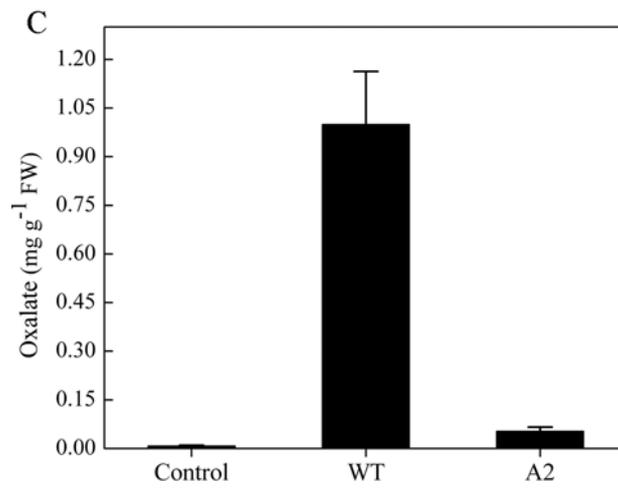
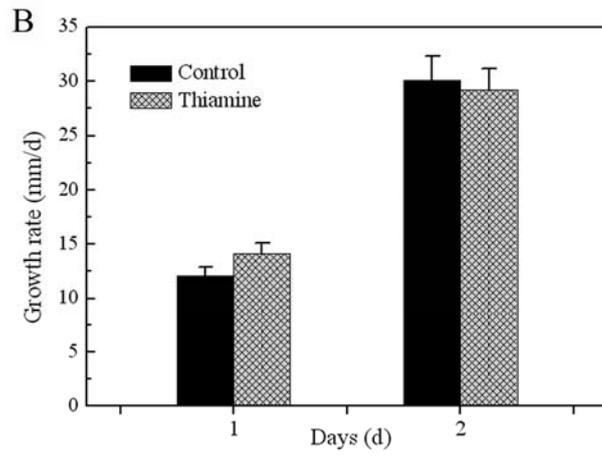


Figure S1

A

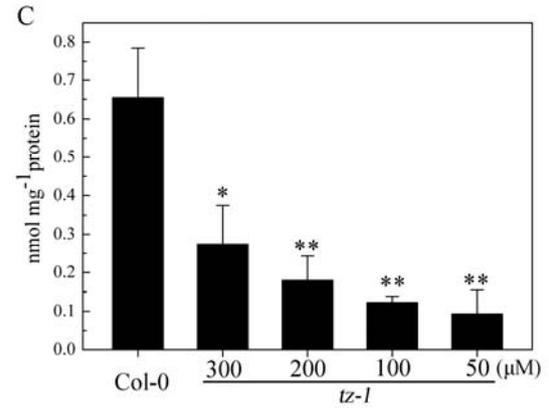
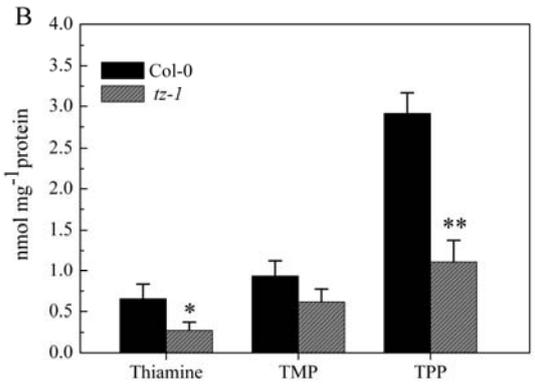
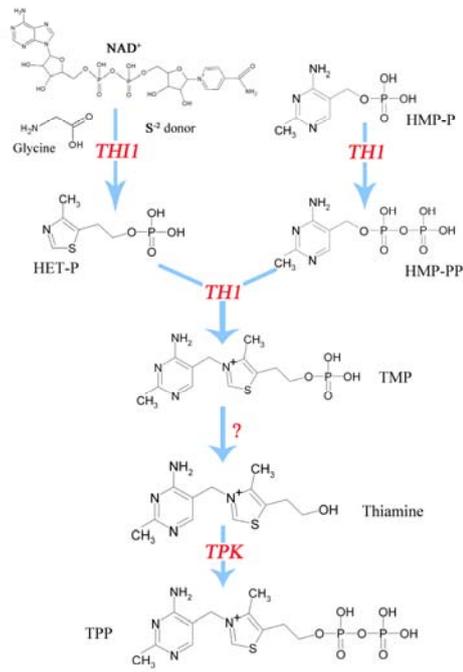


Figure S2

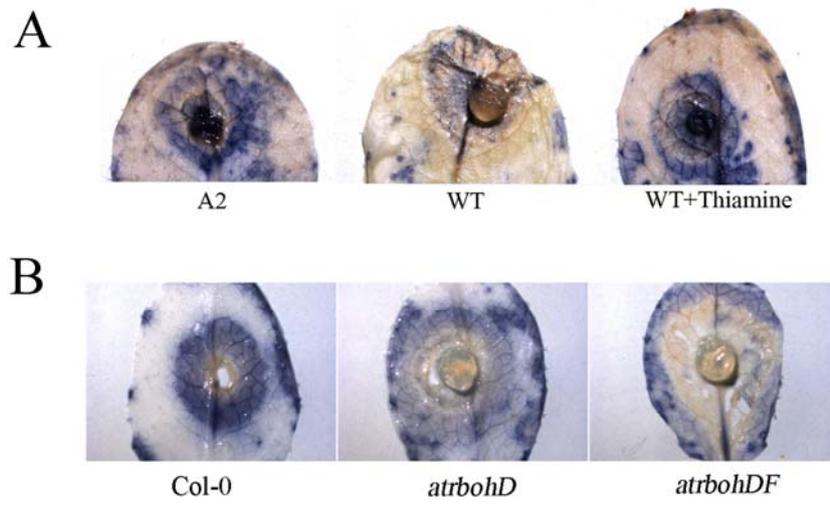


Figure S3

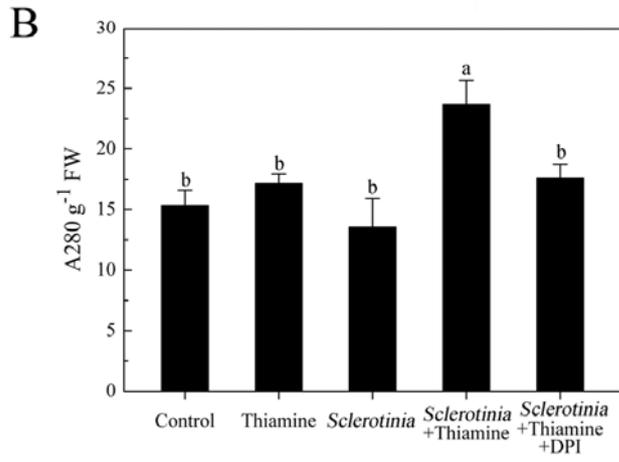
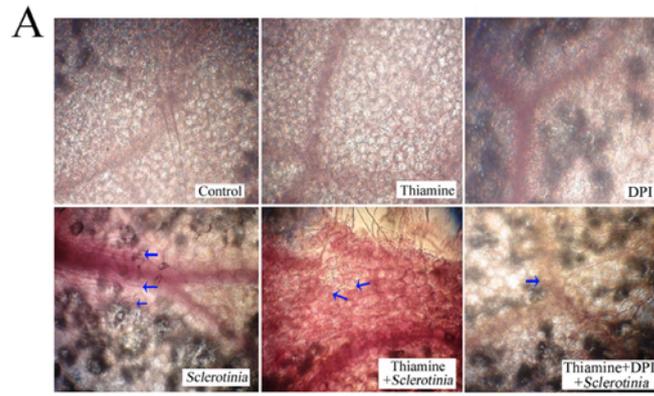


Figure S4

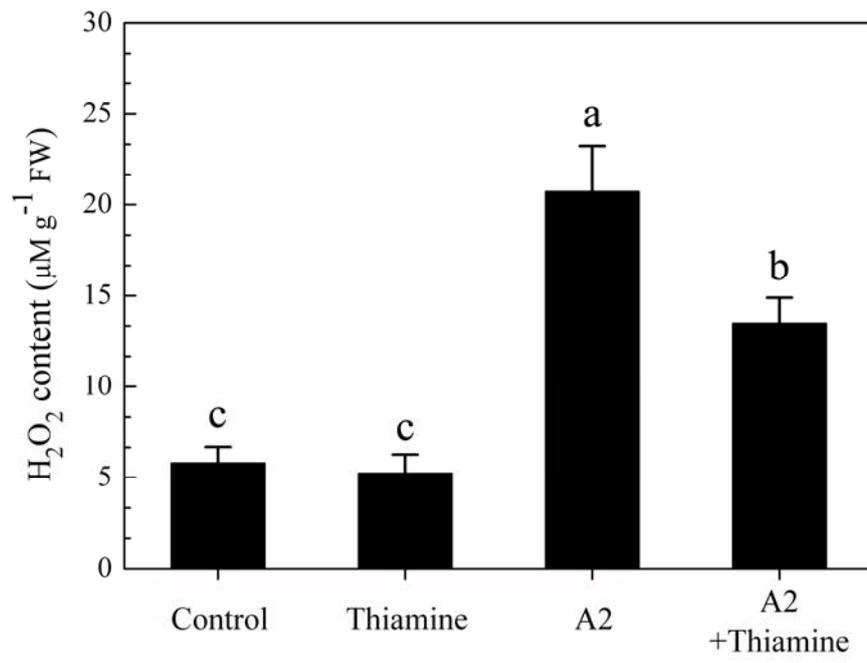


Figure S5

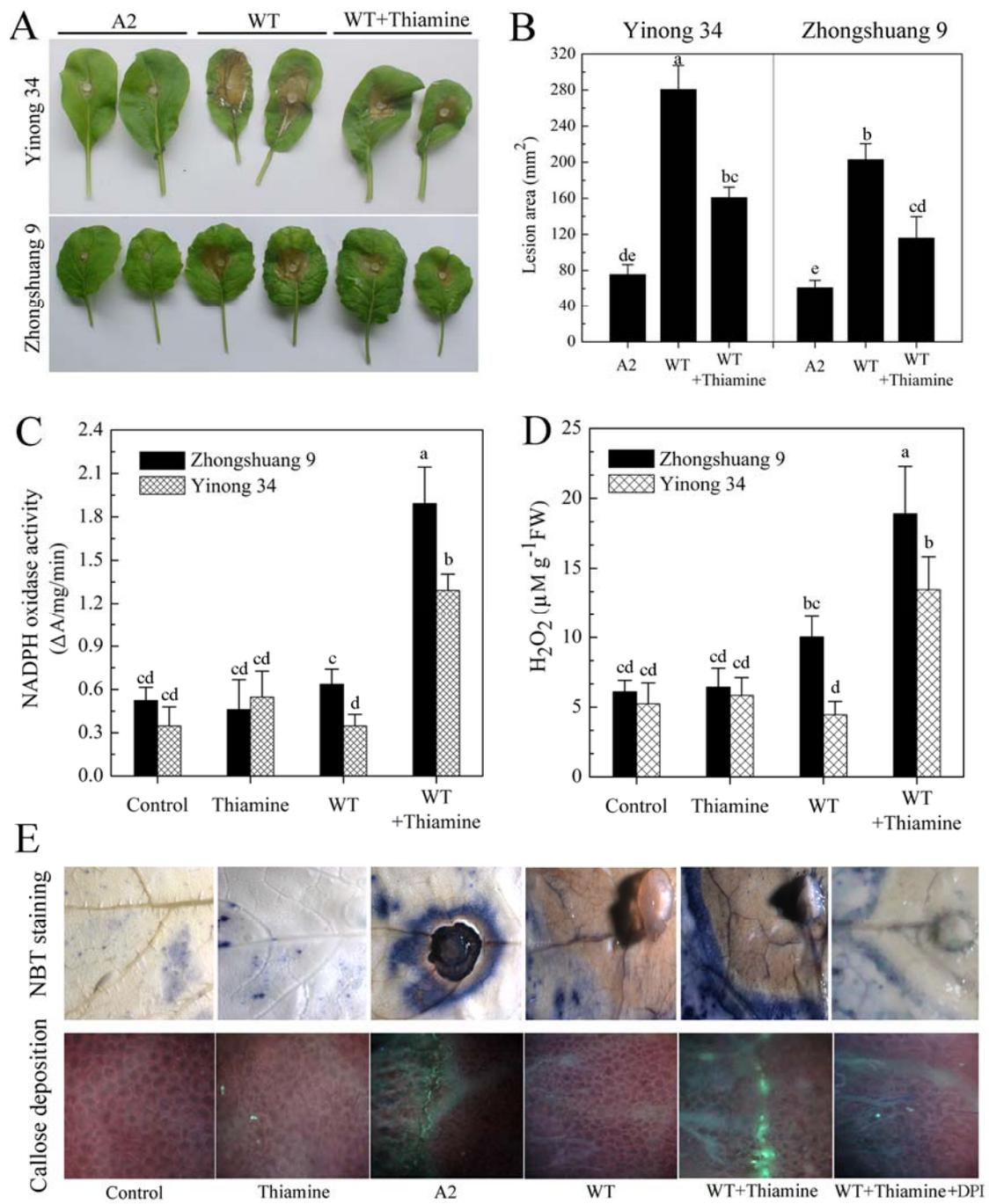


Figure S6