

1 **Supplemental Figure legends**

2 **Supplemental Figure 1**

3 Relationship between CO₂ assimilation rate measured at 1500 μmol photons m⁻² s⁻¹ and 380 μL L⁻¹ CO₂
4 concentration (A_{380}) and the Rubisco activase contents at several leaf temperatures in wild type (triangles)
5 and antisense lines (circles or squares). Plants were grown at 20/15°C (a, c) or 30/25°C (b, d).
6

7 **Supplemental Figure 2**

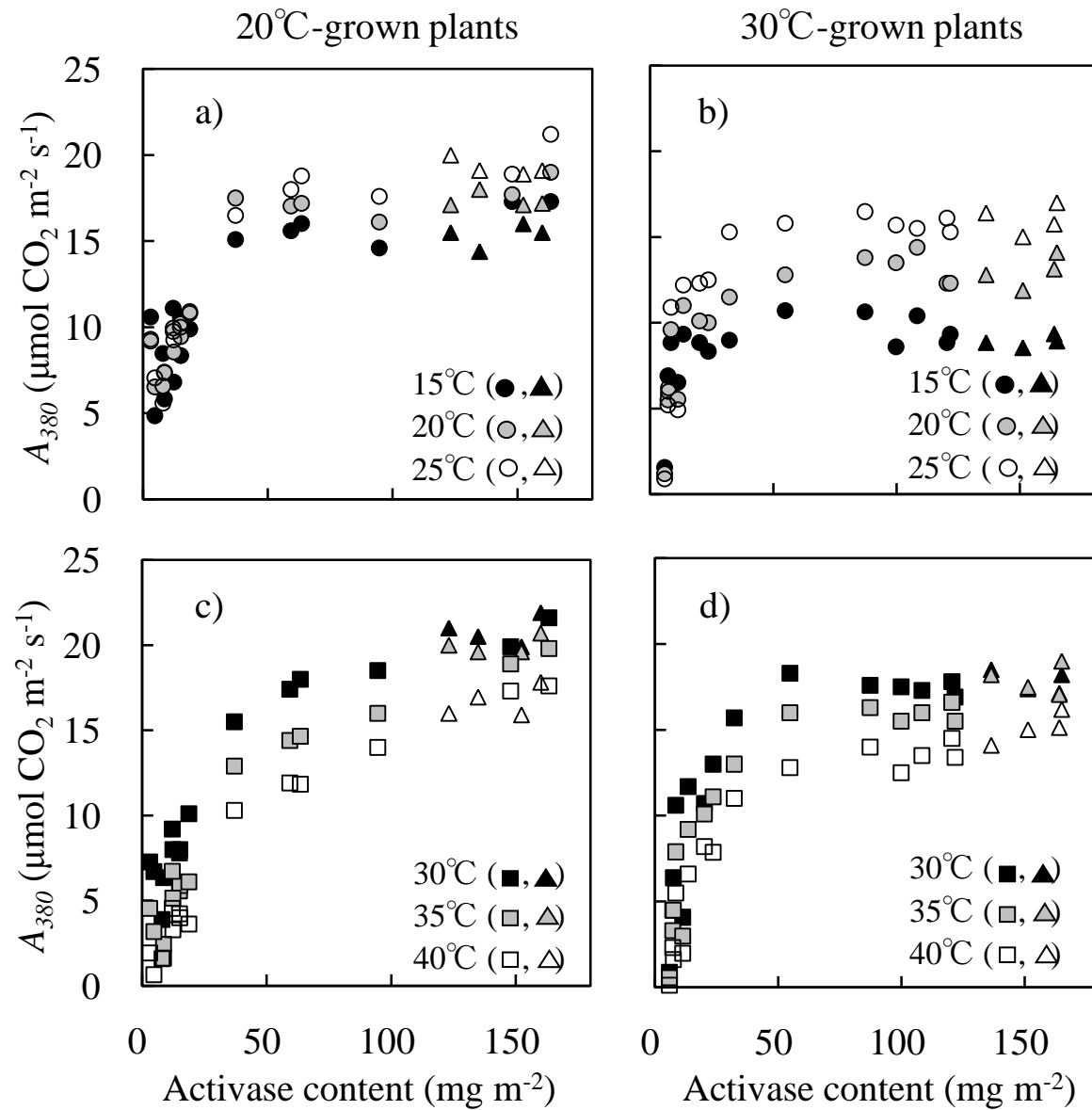
8 Relationship between Rubisco activation state at 1500 μmol photons m⁻² s⁻¹ and 380 μL L⁻¹ CO₂
9 concentration and Rubisco activase contents at several leaf temperatures in wild type (triangles) and
10 antisense lines (circles or squares). Plants were grown at 20/15°C (a, c) or 30/25°C (b, d).
11

12 **Supplemental Figure 3**

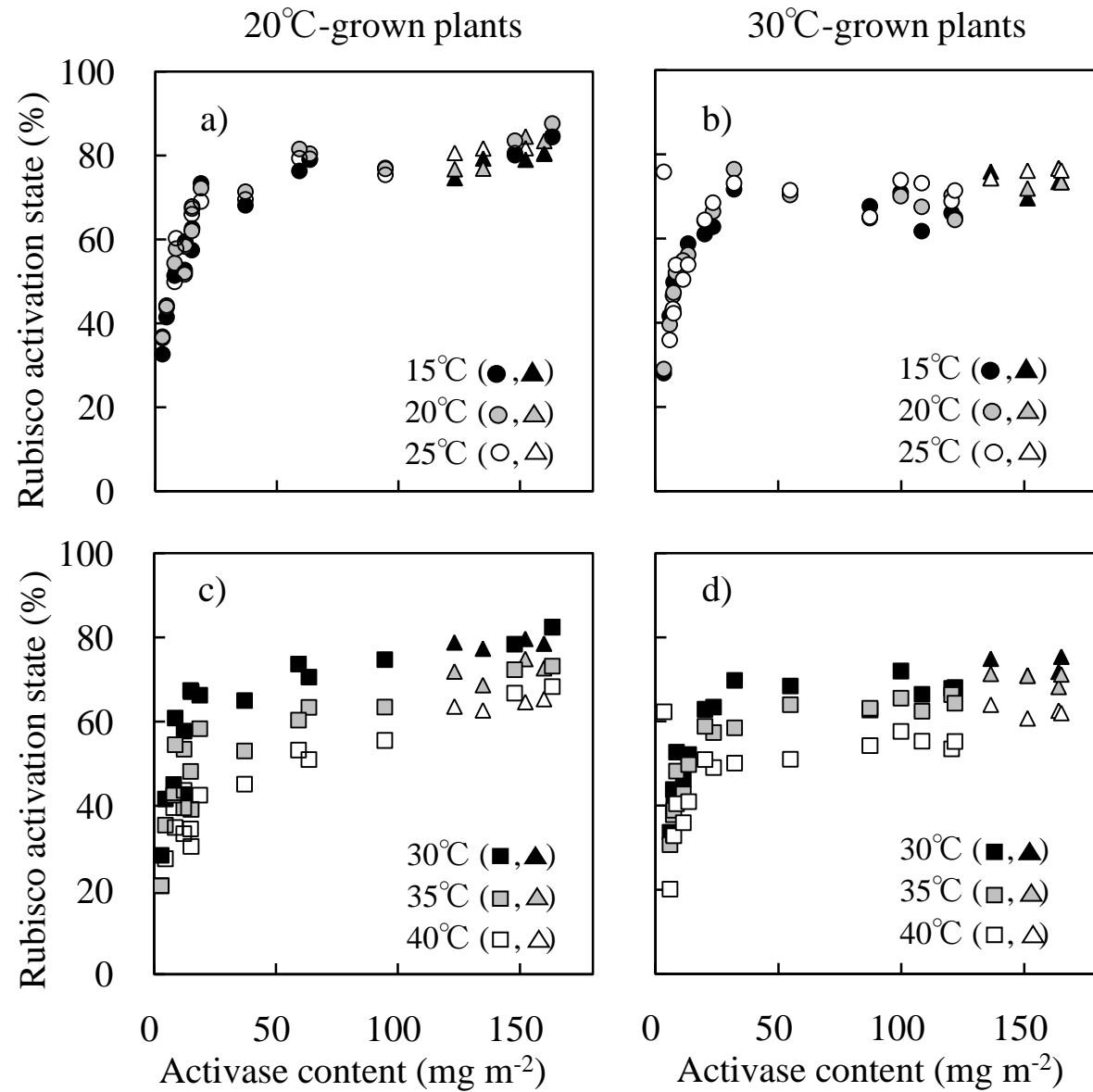
13 CO₂ assimilation rate at 1500 μmol photons m⁻² s⁻¹ and 380 μL L⁻¹ CO₂ concentration (A_{380}) and the
14 Rubisco activation state as a function of the ratio of Activase/Rubisco contents in wild type (triangles) and
15 antisense lines (circles). Plants were grown at 20/15°C (closed symbols) or 30/25°C (open symbols). A_{380}
16 and Rubisco activation state was shown at leaf temperatures of 25°C (a, c) and 40°C (b, d).
17

18 **Supplemental Figure 4**

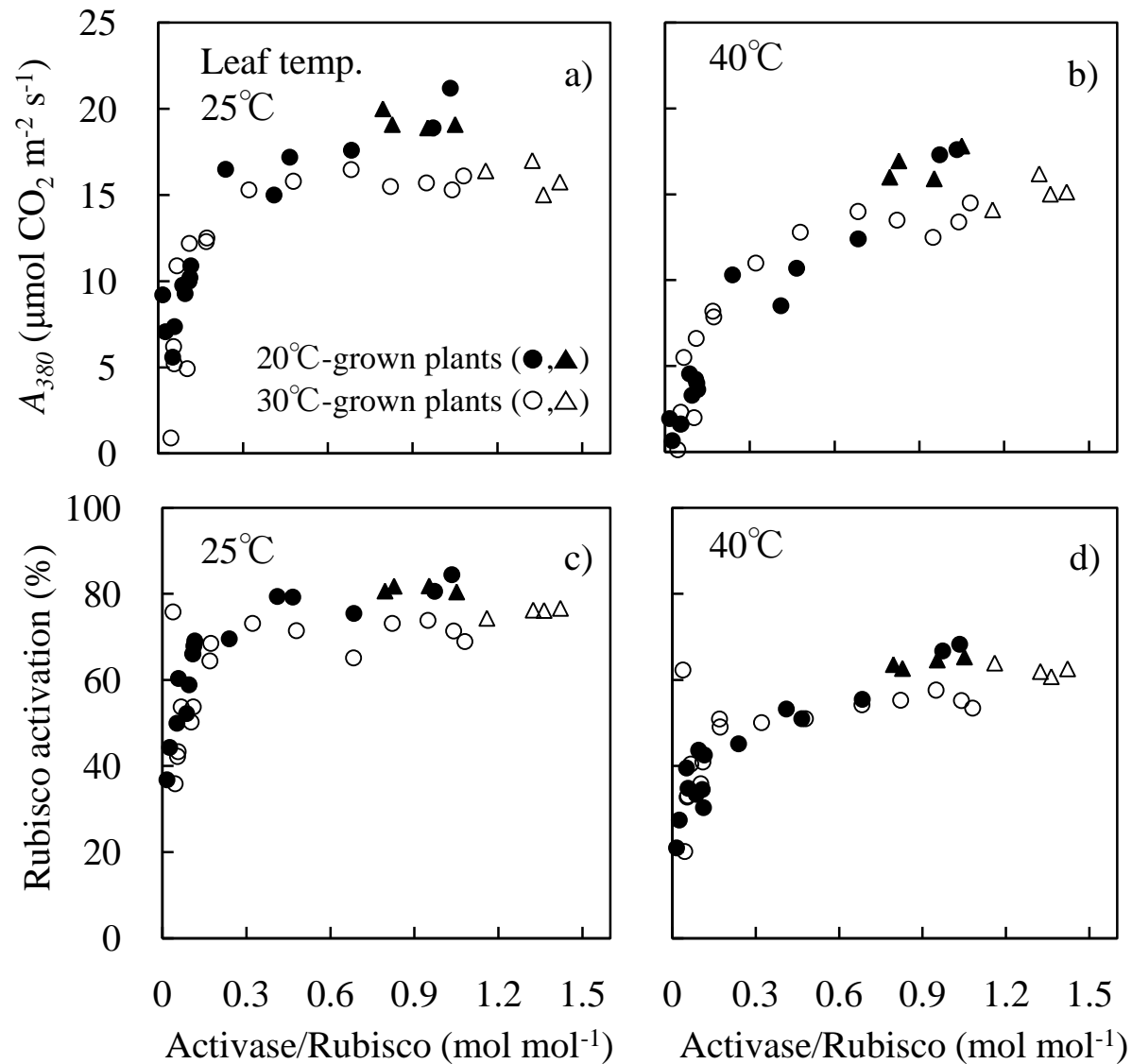
19 CO₂ response of CO₂ assimilation rate (A) measured at 25 & 40°C and 1500 μmol photons m⁻² s⁻¹ in wild
20 type (a), plants with intermediate Rubisco activase contents (b) and plants with low Rubisco activase
21 contents (c) grown at 20/15°C. The explanation of plant classification is given in Table 1. A at 25°C is
22 shown as closed circles, whereas A at 40°C is shown as open circles. Rubisco-limited A (A_c : solid line) was
23 estimated from Eqn 1 in Materials & Methods, whereas RuBP regeneration-limited A (A_r : dotted line) was
24 estimated from Eqn 2 in Materials & Methods. Electron transport rate from chlorophyll fluorescence (J_f) as
25 a function of chloroplast CO₂ concentration (C_c) at 25 & 40°C in wild type (d), plants with intermediate
26 Rubisco activase contents (e) and plants with low Rubisco activase contents (f) in plants grown at 20/15°C.
27 J_f at 25°C is shown as closed symbols, whereas J_f at 40°C is shown as an open symbol. Arrows show
28 measurements made at 380 μL L⁻¹ CO₂ concentration. Data represent means ±SE, n = 4.
29



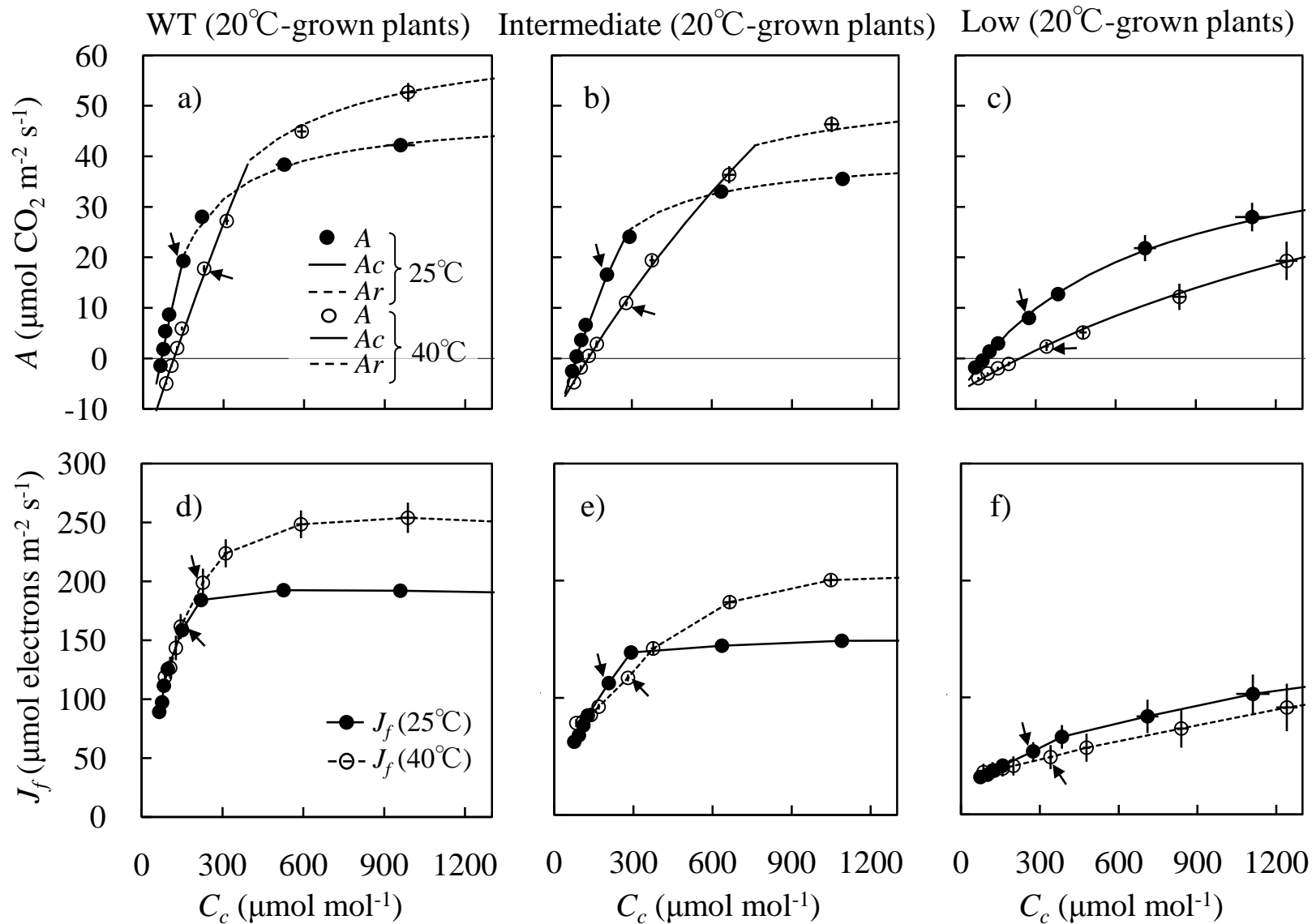
(Supplemental Figure 1) Relationship between CO₂ assimilation rate measured at 1500 $\mu\text{mol photons m}^{-2} \text{ s}^{-1}$ and 380 $\mu\text{L L}^{-1}$ CO₂ concentration (A_{380}) and the Rubisco activase contents at several leaf temperatures in wild type (triangles) and antisense lines (circles or squares). Plants were grown at 20/15° C (a, c) or 30/25° C (b, d).



(Supplemental Figure 2) Relationship between Rubisco activation state at $1500 \mu\text{mol photons m}^{-2} \text{s}^{-1}$ and $380 \mu\text{L L}^{-1} \text{CO}_2$ concentration and Rubisco activase contents at several leaf temperatures in wild type (triangles) and antisense lines (circles or squares). Plants were grown at 20/15° C (a, c) or 30/25° C (b, d).



(Supplemental Figure 3) CO_2 assimilation rate at $1500 \mu\text{mol photons m}^{-2} \text{ s}^{-1}$ and $380 \mu\text{L L}^{-1}$ CO_2 concentration (A_{380}) and the Rubisco activation state as a function of the ratio of Activase/Rubisco contents in wild type (triangles) and antisense lines (circles). Plants were grown at $20/15^\circ \text{C}$ (closed symbols) or $30/25^\circ \text{C}$ (open symbols). A_{380} and Rubisco activation state was shown at leaf temperatures of 25°C (a, c) and 40°C (b, d).



(Supplemental Figure 4) CO₂ response of CO₂ assimilation rate (A) measured at 25 & 40° C and 1500 $\mu\text{mol photons m}^{-2} \text{ s}^{-1}$ in wild type (a), plants with intermediate Rubisco activase contents (b) and plants with low Rubisco activase contents (c) grown at 20/15° C. The explanation of plant classification is given in Table 1. A at 25° C is shown as closed circles, whereas A at 40° C is shown as open circles. Rubisco-limited A (A_c ; solid line) was estimated from Eqn 1 in Materials & Methods, whereas RuBP regeneration-limited A (A_r ; dotted line) was estimated from Eqn 2 in Materials & Methods. Electron transport rate from chlorophyll fluorescence (J_f) as a function of chloroplast CO₂ concentration (C_c) at 25 & 40° C in wild type (d), plants with intermediate Rubisco activase contents (e) and plants with low Rubisco activase contents (f) in plants grown at 20/15° C. J_f at 25° C is shown as closed symbols, whereas J_f at 40° C is shown as open symbol. Arrows show measurements made at 380 $\mu\text{L L}^{-1}$ CO₂ concentration. Data represent means \pm SE, $n = 4$.