

1 **Supplementary methods**

2 **Chlorophyll quantification**

3 300 mg of leaves were ground in liquid nitrogen, and the powder was mixed with 5 mL of
4 80% acetone. Samples were incubated in the dark with shaking for 15-30 min. After 10 min
5 centrifugation at 4000g at 4°C, the supernatant was collected, and 5mL 80% Acetone were
6 added to the pellet. After incubation in the dark and centrifugation, supernatants were pooled
7 and chlorophyll was quantified by measuring their absorbance at 663 and 645 nm. Total
8 chlorophyll content was calculated according to the following formula.

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$$Ca+b \text{ (mg/g)} = [8.02 \times A_{663} + 20.20 \times A_{645}] \times V / 1000 \times W$$

10 Where V = volume of the extract (ml); W = Weight of fresh leaves (g).

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12 **Photosynthetic activity measurements**

13 For gas exchange measurements, plants were grown under ambient air and SD conditions at a
14 light intensity of 100 $\mu\text{mol photons m}^{-2} \text{ sec}^{-1}$ for 6 weeks and a fully expanded leaf was
15 placed in a gas-exchange chamber (LCF 6400-40, LiCOR, Lincoln, NE, USA) connected to a
16 portable photosynthesis system (LI 6400XT, LiCOR, Lincoln, Nebraska, USA). Measures
17 were performed under the following conditions: 250 $\mu\text{mol photons m}^{-2} \text{ sec}^{-1}$ of light intensity,
18 a leaf temperature of 21°C, 60–70% relative humidity (VPD leaf approximately equal to 1)
19 and 0.21 L O₂ L⁻¹. CO₂ concentration was first set at 380 $\mu\text{L L}^{-1}$ for three steps of 15 min.
20 Next, photosynthetic activity was measured at different CO₂ concentrations ranging from 100
21 to 1600 $\mu\text{L CO}_2 \text{ L}^{-1}$.

22 Measurements of chlorophyll fluorescence parameters of individual leaves were performed
23 using an IMAGING-PAM, M-Series (Walz, Effeltrich, Germany). The apparent rate of
24 photosynthesis or electron transport rate (ETR) was calculated as $\text{ETR} = 0.5 \times Y(\text{II}) \times \text{PAR} \times$
25 $\text{Abs. } \mu\text{equivalents m}^{-2} \text{ s}^{-1}$ with Y(II) being the effective PSII quantum yield ($Y(\text{II}) = (\text{Fm}' -$
26 $\text{F}) / \text{Fm}'$); Fm: maximum fluorescence, Fm': maximum fluorescence in the light; PAR:
27 photosynthetic active radiation; Abs.: PAR-Absorptivity.

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