SUPPLEMENTARY MATERIAL

Table S1: Photosynthetic characterization of wild type and koLchb mutants.

PSII functional antenna size was obtained by analysis of *in vivo* chlorophyll fluorescence, measured on intact leaves. The fluorescence rise ($T_{2/3}$) was measured in $3.0 \cdot 10^{-5}$ M DCMU infiltrated leaves using a flash of green light (7 µmol m^{-2} s^{-1}, 8 s). The $T_{2/3}$ parameter is inversely related to the incident photon flux and is an index of the functional antenna size of PSII. Relative electron transport rate (ETR) and excitation pressure on PSII (1-qP) were determined through analysis of room temperature chlorophyll fluorescence during photosynthesis. Leaves from dark-adapted plants were given 30 min of illumination (600 µmol m^{-2} s^{-1}, RT); photosynthetic efficiency (Φ_{PSII}) values were used to calculate relative electron transport rate according to the equation $relETR = 0.5 \cdot \Phi_{PSII} \cdot PAR$; qP was measured during steady state photosynthesis as well. Amplitude of light-dependent fluorescence quenching of 9-AA during thylakoid lumen acidification (induced by red actinic light, 600 µmol m^{-2} s^{-1}, RT) were measured on intact chloroplasts from WT and koLhcb and was quantified as a measure for trans-thylakoid ΔpH. Significantly different values with respect to the WT (student's *t* test) are marked with an asterisk ($P<0.05$, $n=4$).

	Functional Antenna size ($1/T_{2/3} \cdot 10^{-3}$, ms^{-1})	Relative ETR ($0.5 \cdot PAR \cdot \Phi_{PSII}$)	Excitation pressure on PSII (1-qP)	trans-thylakoid ΔpH (9-AA quenching)
WT	2.96 ± 0.59	113.8 ± 7.8	0.44 ± 0.04	0.42 ± 0.04
koCP26	2.69 ± 0.31	108.9 ± 5.3	0.39± 0.06	0.44± 0.02
koCP24/26	2.81 ± 0.34	107.5 ± 11.9	0.36 ± 0.09	0.46 ± 0.04
koCP29	3.10 ± 0.31	118.8 ± 8.4	0.44 ± 0.03	0.47 ± 0.04