

Table 1S. The original data on PSII performance by OJIP test. The values are the mean and SE of eight plants. ABS/CS_M – absorbed photon flux per cross section; ABS/RC – average absorbed photon flux per PSII reaction section center; Area – total complementary area between fluorescence induction curve and F = F_M; ET₀/CS_M – electron transport flux from Q_A to Q_B per cross section; ET₀/RC – electron transport flux from Q_A to Q_B per PSII; F₀ – minimal fluorescence of dark-adapted state; F_I – fluorescence at I step of OJIP; F_J – fluorescence at J step of OJIP; F_K – fluorescence at K step of OJIP; F_M – maximal fluorescence of dark-adapted state; M₀ – approximate value of the initial slope of relative variable Chl fluorescence curve V_i; N – reduction times of Q_A from F₀ to F_M; PI_{total} – performance index for energy conservation from photons absorbed by PSII antenna, until the reduction of PSI acceptors; S_M – normalized area; RC/CS_M – probability that a PSII Chl function as active centers; T_{FM} – time to reach maximal fluorescence F_M; TR₀/CS_M – maximum trapped excitation flux per cross section; TR₀/RC – maximum trapped excitation flux per PSII; ϕ_{D0} – quantum yield (at t = 0) for energy dissipation; ϕ_{E0} – quantum yield for electron transport; ϕ_{Pav} – average (from time 0 to t_{FM}) quantum yield for primary photochemistry; ϕ_{P0} – maximum quantum yield of primary PSII photochemistry; ψ_0 – probability (at t = 0) that a trapped excitation moves an electron into the electron transport chain beyond Q_A⁻; δ_{R0} – the efficiency with which an electron can move from the reduced intersystem electron acceptors to the PSI end acceptors.

Treatment	Control	D	C750	C750×D
Basic parameters for PSII				
F ₀	125.500 ± 8.484	129.000 ± 11.421	126.286 ± 7.140	132.833 ± 14.443
F _M	598.875 ± 39.610	528.571 ± 46.170	613.857 ± 44.127	577.500 ± 62.899
F _K	153.889 ± 10.731	162.500 ± 10.013	158.364 ± 6.765	187.571 ± 16.437
F _J	241.778 ± 16.383	250.875 ± 19.990	242.182 ± 12.227	279.714 ± 20.708
F _I	394.444 ± 20.356	385.750 ± 18.057	421.818 ± 36.538	414.857 ± 21.118
Area	21331.375 ± 1696.47	10722.571 ± 2841.14	22070.714 ± 1827.38	13572.500 ± 2068.13
T _{FM}	0.400 ± 0.156	0.210 ± 0.089	0.500 ± 0.170	0.280 ± 0.097
M ₀	0.240 ± 0.094	0.335 ± 0.138	0.263 ± 0.086	0.492 ± 0.167
S _M	45.062 ± 4.394	26.835 ± 4.560	45.267 ± 4.643	30.523 ± 5.652
N	44.007 ± 9.208	29.505 ± 6.757	50.116 ± 12.117	45.500 ± 12.947
RC/CS _M	484.723 ± 97.635	363.416 ± 49.679	440.393 ± 42.984	298.298 ± 39.743
PI _{total}	10.102 ± 0.75	2.397 ± 0.210	9.421 ± 0.560	2.592 ± 0.198
Yields and flux ratios				
ϕ_{Pav}	89.048 ± 8.429	96.600 ± 17.260	71.908 ± 7.627	83.936 ± 6.064
ϕ_{P0}	0.790 ± 0.008	0.756 ± 0.012	0.794 ± 0.010	0.770 ± 0.005
ψ_0	0.754 ± 0.036	0.695 ± 0.052	0.762 ± 0.034	0.670 ± 0.064
ϕ_{E0}	0.596 ± 0.029	0.525 ± 0.041	0.605 ± 0.031	0.516 ± 0.049
ϕ_{D0}	0.210 ± 0.007	0.244 ± 0.011	0.206 ± 0.010	0.230 ± 0.005
δ_{R0}	0.572 ± 0.052	0.514 ± 0.080	0.517 ± 0.049	0.546 ± 0.116
Specific energy fluxes (per active PSII reaction center)				
ABS/RC	1.235 ± 0.193	1.454 ± 0.359	1.394 ± 0.138	1.936 ± 0.514
TR ₀ /RC	0.977 ± 0.155	1.099 ± 0.276	1.107 ± 0.111	1.491 ± 0.396
ET ₀ /RC	0.737 ± 0.094	0.764 ± 0.142	0.844 ± 0.038	0.998 ± 0.250
Phenomenological energy fluxes/activities (per excited cross section CS)				
ABS/CS _M	598.875 ± 39.61	528.571 ± 46.170	613.857 ± 44.127	577.500 ± 62.899
TR ₀ /CS _M	473.375 ± 27.310	399.571 ± 36.919	487.571 ± 39.297	444.667 ± 45.718
ET ₀ /CS _M	357.097 ± 31.530	277.696 ± 46.170	371.675 ± 44.127	297.786 ± 58.340