

SUPPLEMENTARY INFORMATION

**Lack of fructose 2,6-bisphosphate compromises photosynthesis and growth in
Arabidopsis in fluctuating environments**

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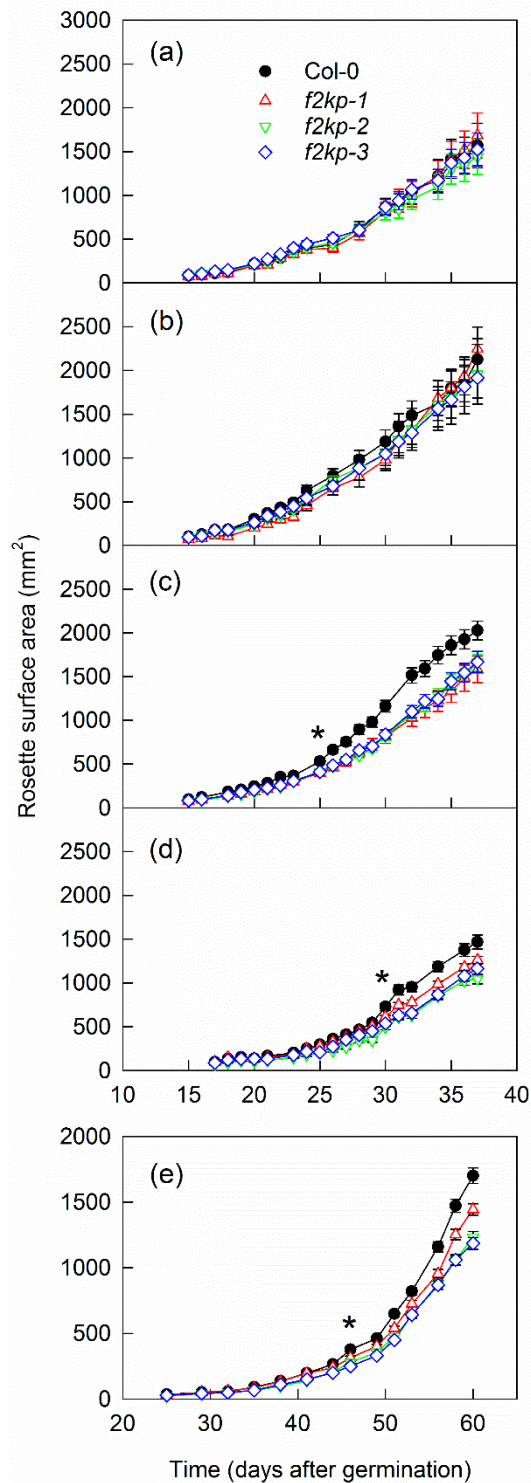


Figure S1. Rosette growth of Col-0 and *f2kp* mutant lines. Rosette size was monitored for plants grown in an 8 h light/16 h dark photoperiod under (a) low light, (b) high light, (c) fluctuating light and (d) fluctuating temperature, as well as (e) natural lighting in a glasshouse. Each value is the mean \pm SE from 24 independent plants, except for those in the glasshouse which were from 48 plants. All samples were monitored for 37 days post-germination, except for those in (e) which were measured for 60 days. Under fluctuating conditions (c-e), wildtype (Col-0) plants outgrew *f2kp* mutants and were significantly larger than any *f2kp* line from the time point indicated by * onwards as determined by ANOVA followed by Tukey's HSD test ($P < 0.05$). Plant lines are: ●, Col-0; △, *f2kp-1*; ▽, *f2kp-2*; ◇, *f2kp-3*.

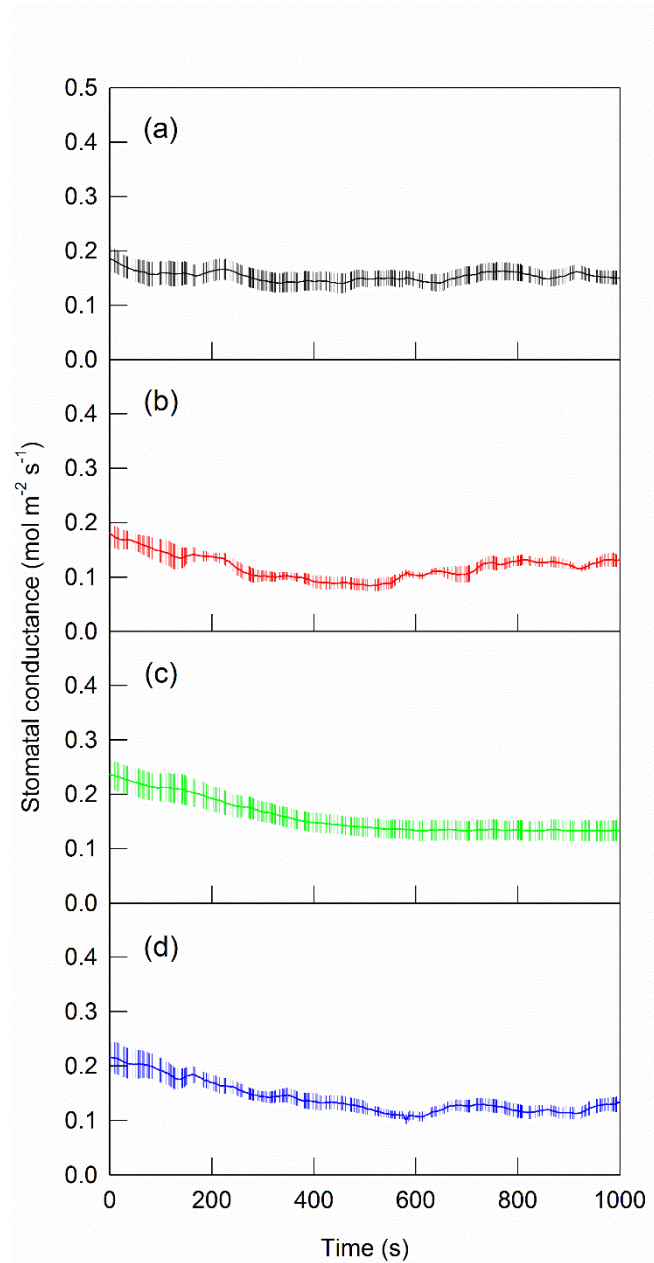


Figure S2. Stomatal conductance of leaves from Col-0 and *f2kp* mutant lines. Stomatal conductance was determined from infra-red gas analysis measurements obtained in the experiments shown in Figure 8c. Data are plotted as the mean \pm SE of measurements from eight separate plants. Plant lines are: (a) —, Col-0; (b) —, *f2kp-1*; (c) —, *f2kp-2*; (d) —, *f2kp-3*.

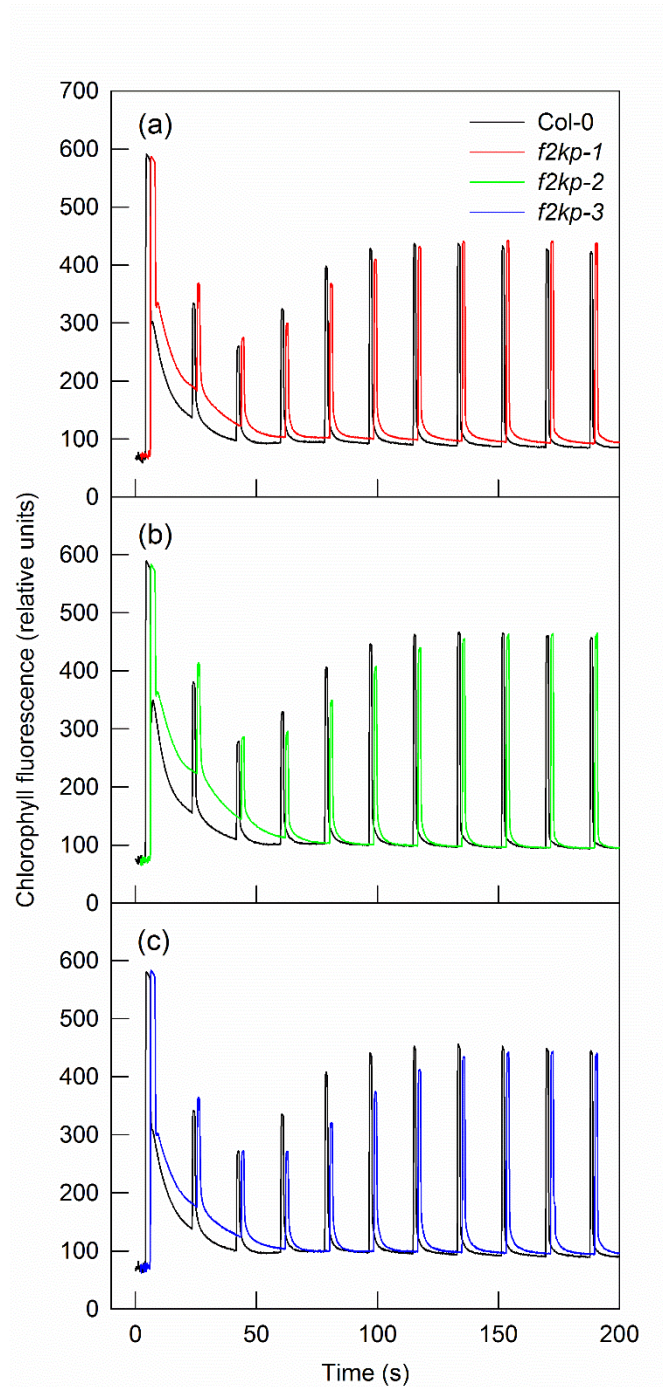


Figure S3. Chlorophyll fluorescence profiles of leaves from Col-0 and *f2kp* mutant lines. Representative fluorescence profiles of Col-0 (—) are compared directly with those of (a) *f2kp-1*, (b) *f2kp-2* and (c) *f2kp-3*. Data were obtained during the experiments used to determine the photosynthetic parameters presented in Figures 9b and 9c.

Table S1. Enzyme activities in leaves of *f2kp* mutant lines.

Leaves were harvested 4 h after the beginning of the photoperiod from 6-week-old plants grown in low light (80 $\mu\text{mol m}^{-2} \text{s}^{-1}$ PAR) in an 8 h day/16 h night regime. Each value is the mean \pm SE of measurements on individual leaves from four separate plants. There were no significant difference between plant lines in the activity of any enzyme, chlorophyll content or protein content as assessed by ANOVA ($P > 0.05$).

Plant line	Enzyme activity (nmol min ⁻¹ g ⁻¹ fresh weight)								Chlorophyll content (mg g ⁻¹ fresh weight)			Protein content (mg g ⁻¹ fresh weight)			
	Cytosolic FBPase			PFP		PFK									
Col-0	615.9	±	63.4	171.1	±	7.7	120.6	±	8.1	0.96	±	0.14	12.2	±	0.32
<i>f2kp-1</i>	525.1	±	36.3	188.6	±	7.2	156.5	±	17.4	0.91	±	0.07	12.6	±	0.23
<i>f2kp-2</i>	583.4	±	81.2	166.4	±	11.2	136.7	±	10.0	0.91	±	0.11	10.9	±	0.71
<i>f2kp-3</i>	550.6	±	61.8	189.9	±	19.3	134.7	±	4.2	1.10	±	0.06	11.2	±	0.86

Table S2. Sequences of synthetic oligonucleotides used in this study

Primer ID	Primer sequence (5' to 3')
SALK_LBb1.3	ATTTTGCCGATTTCGGAAC
FKP1_LP	GCTAGCGACTTCGCTTCTCT
FKP1_RP	TGGACGTTGCAGTCAAAACT
FKP2_LP	CTTGCCAGCTTTGTTGAAAAG
FKP2_RP	ATGATCACAGGTTCAAGCCTG
FKP3_LP	ATGCACCACAGAGAATAACCG
FKP3_RP	TATTTCTCCCCATGGGAATTC
RT-LP1	CTTCCTCTCATCGGTTCTCTG
RT-RP1	TCAGCGTTGATGAAGACTCG
016 RT-RP2	TCATCCCATCACAAACTCCA
ACT4-LP	GGACGGTGAAGACATTCAAC
ACT4-RP	CAATATAGAGCCACCGATCC