

**Table S1** Mutant lines and measurement regime used in this study.

**a)**

	Loci affected	Mutant	Subdivision	T-DNA identifier	Mutant type	Created/First described by	Number in supplemental data
Class I TCP	AT1G69690	<i>tcp15</i>	TCP15-likes	SALK_011491	Loss-of-function	Alonso <i>et al.</i> , 2003	20
	AT3G47620 - AT1G69690	<i>tcp14 tcp15</i>		SALK_011491	Loss-of-function	Kieffer <i>et al.</i> , 2011	19
	AT1G58100 - AT1G69690	<i>tcp8 tcp15</i>		SAIL_656_F11 - SALK_011491	Loss-of-function	In house	6
	AT1G58100	<i>tcp8</i>	TCP20-associated	SAIL-656-F11	Loss-of-function	Aguilar-Martinez <i>et al.</i> , 2013	10
	AT3G27010 - AT1G58100	<i>tcp20 tcp8</i>		SALK_041906 - SAIL_656_F11	Loss-of-function	Danisman <i>et al.</i> , 2013	3
	AT2G45680	<i>tcp9</i>		SALK_035853	Loss-of-function	Danisman <i>et al.</i> , 2012	2
	AT2G45680 - AT3G27010	<i>tcp9 tcp20</i>		SALK_035853 - SALK_041906	Loss-of-function	Danisman <i>et al.</i> , 2012	1
	AT3G27010	<i>tcp20</i>		SALK_041906	Loss-of-function	Danisman <i>et al.</i> , 2013	24
	AT5G51910 - AT3G27010	<i>tcp19 tcp20</i>		SALK_024434 - SALK_041906	Loss-of-function	Danisman <i>et al.</i> , 2013	17
	AT3G27010 - AT1G72010	<i>tcp20 tcp22</i>	TCP20-likes	SALK_041906 - SALK_045755	Loss-of-function	In house	18
	AT5G51910 - AT1G72010	<i>tcp19 tcp22</i>		SALK_024434 - SALK_045755	Loss-of-function	In house	16
	AT5G51910 - AT3G27010 - AT1G72010	<i>tcp19 tcp20 tcp22</i>		SALK_024434 - SALK_041906 - SALK_045755	Loss-of-function	In house	15
Class II TCP	AT5G60970	<i>tcp5</i>	TCP5-likes	SM_3_29639	Loss-of-function	Efroni <i>et al.</i> , 2008	22
	AT5G60970 - AT3G02150 - AT5G08070	<i>tcp5 tcp13 tcp17</i>		SM_3_29639 - SM_3_23151 - SALK_147288	Loss-of-function	Efroni <i>et al.</i> , 2008	11
	AT5G60970 - AT3G02150 - AT5G08070	<i>miR-3TCP: tcp5, -13, -17</i>		Artificial miRNA overexpression	Loss-of-function	Efroni <i>et al.</i> , 2008	5
	AT5G60970	<i>pATML1:TCP5</i>		Overexpression of TCP5 in epidermis	Gain-of-function	Van Es <i>et al.</i> , 2018	13
	AT3G02150	<i>pATML1:TCP13</i>		Overexpression of TCP13 in epidermis	Gain-of-function	In house	12
	AT2G31070	<i>tcp10</i>	JAW-likes	SALK_137205	Loss-of-function	Alonso <i>et al.</i> , 2003	23
	AT4G18390 - AT1G53230 - AT3G15030 - AT2G31070 - AT1G30210	<i>jaw-D: tcp2, -3, -4, -10, -24</i>	CYC (BRANCHE D-likes)	Overexpression of miR319	Loss-of-function	Palatnik <i>et al.</i> , 2003	14
	AT3G18550	<i>brc1/tcp18</i>		SALK_091920	Loss-of-function	Aguilar-Martinez <i>et al.</i> , 2007	21
	AT1G68800	<i>brc2/tcp12</i>		SALK_023116	Loss-of-function	Aguilar-Martinez <i>et al.</i> , 2007	7
	AT1G68800 - AT3G18550	<i>brc1brc2</i>		SALK_091920 - SALK_023116	Loss-of-function	Aguilar-Martinez <i>et al.</i> , 2007	4
Control lines	Colo "WUR"		Wild type background for gain-of-function mutants <i>pATML1:TCP5</i> and <i>pATML1:TCP13</i>				8
	Colo "NASC"		Wild type background for loss-of-function mutants, T-DNA and artificial miRNA				9

**b)**

**Growing and measurement scheme**

0:00		8:00	P A M	16:00	
0:30		8:30		16:30	NIR
1:00		9:00	N I R	17:00	PAM
1:30	N I R	9:30		17:30	
2:00		10:00		18:00	
2:30		10:30		18:30	
3:00		11:00	P A M	19:00	
3:30		11:30		19:30	
4:00		12:00		20:00	
4:30	P A M	12:30		20:30	
5:00		13:00	N I R	21:00	NIR
5:30		13:30		21:30	
6:00		14:00		22:00	
6:30		14:30		22:30	
7:00		15:00	P A M	23:00	NIR
7:30		15:30		23:30	

(a) Mutant and overexpression lines and wild type controls used in this study. Shown are the affected loci, mutant name, division in sub-groups for analyses, the T-DNA or construct identifier, the type of mutant, and reference to the paper in which the lines were initially described. The number in the column on the right is a unique identifier, which is used as reference in all graphs. (b) Shows how the measurements were scheduled during each 24 hr cycle in the rosette stage. Day time is depicted in yellow and night time in grey. Measurements include near infrared reflectance (NIR) and pulse-amplitude-modulation (PAM), as measure for  $\Phi$ PSII.