Table S1: Phenotypic correlations among traits across different environmental conditions

	Control				Cold acclimation				Freezing treatment				1 day post freezing treatment				outdoor environment		
Variable	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3
Control																			
1. LT_{50} (SD)	1																		
2. LT_{50} (LD)	.73**	1																	
3. Fv/Fm (SD)	-.17	-.11	1																
4. Fv/Fm (LD)	-.08	-.09	-.09	1															
Cold acclimation																			
1. LT_{50} (SD)	.67**	.62**	-.10	.01	1														
2. LT_{50} (LD)	.68**	.67**	-.07	.02	.95**	1													
3. Fv/Fm (SD)	-.29**	-.22*	.19*	-.04	-.28**	-.18	1												
4. Fv/Fm (LD)	-.19	-.14	.42**	-.05	-.16	-.12	.26**	1											
Freezing treatment																			
1. EL (SD)	.69**	.65**	-.15	-.01	.86**	.83**	-.33**	-.22*	1										
2. EL (LD)	.68**	.65**	-.14	-.01	.80**	.81**	-.30**	-.19	.85**	1									
3. Fv/Fm (SD)	-.63**	-.60**	.14	-.04	-.91**	-.86**	.29**	.18	-.93**	-.79**	1								
4. Fv/Fm (LD)	-.63**	-.57**	.07	.04	-.77**	-.80**	.26**	.17	-.79**	-.84**	.77**	1							
1 day post freezing treatment																			
1. EL (SD)	.69**	.61**	-.11	-.03	.874**	.86**	-.32**	-.18	.91**	.82**	-.89**	-.77**	1						
2. EL (LD)	.63**	.54**	-.16	-.01	.844**	.86**	-.32**	-.19*	.84**	.84**	-.85**	-.80**	.88**	1					
3. Fv/Fm (SD)	-.66**	-.59**	.10	.07	-.825**	-.80**	.34**	.17	-.87**	-.82**	.83**	.69**	-.95**	-.85**	1				
4. Fv/Fm (LD)	-.62**	-.51**	.17	-.00	-.808**	-.81**	.35**	.19*	-.83**	-.80**	.84**	.78**	-.89**	-.97**	.86**	1			
Outdoor environment																			
1. Overall winter damage	-.08	-.16	-.05	.01	-.06	-.06	.01	-.03	-.01	-.05	.03	-.08	-.03	.05	.05	-.05	1		
2. Fv/Fm (MF)	-.13	-.23*	.11	-.08	-.20*	-.23*	.26**	.14	-.20*	-.21*	.23*	.18	-.21*	-.23*	.20*	-.23*	.40**	1	
3. Fv/Fm (SF)	-.06	-.16	-.05	-.14	-.12	-.12	.21*	.04	-.05	-.11	.10	.06	-.07	-.04	.06	.04	.69**	.56**	1

** means correlation is significant at the 0.01 level (2-tailed) and * means correlation is significant at the 0.05 level (2-tailed).
SD ; short day, LD ; long day, MF : mild freezing (Jan., 2012), SF : severe freezing (Feb., 2012)

Table S2: Summary of putative QTLs controlling freezing tolerant and photosynthetic performance related traits in the multi-trait QTL model

Condition	Linkage group	Locus name	Position	LOD Score	Traits	Add.eff.	High value allele	% Expl. Var.	P	s.e.
SD_CA	4	At2g36390	83.33	4.30	LT50	0.03	LTM	15.50	0.00	0.00
					Fv/Fm	0.00	LTM	2.60	0.07	0.00
	7	Bst001405	83.33	5.99	LT50	0.02	LTM	5.40	0.01	0.00
					Fv/Fm	0.00	LTM	21.70	0.00	0.00
LD_CA	4	At2g36390	83.33	4.58	LT50	0.02	LTM	11.70	0.00	0.00
					Fv/Fm	0.00	LTM	5.60	0.00	0.00
	7	Bst001405	83.33	7.11	LT50	0.01	LTM	4.40	0.03	0.00
					Fv/Fm	0.00	LTM	22.90	0.00	0.00
SD_FT	2	MAF1	121.88	3.82	EL	0.00	LTM	0.00	0.96	0.01
					Fv/Fm	0.00	SAD12	1.00	0.26	0.00
	3	A10	92.74	12.92	EL	0.02	SAD12	3.90	0.03	0.01
					Fv/Fm	0.01	LTM	12.20	0.00	0.00
	4	At2g36390	83.33	3.79	EL	0.04	SAD12	12.80	0.00	0.01
					Fv/Fm	0.01	LTM	8.60	0.00	0.00
LD_FT	4	At2g36390	83.33	3.53	EL	0.03	SAD12	10.80	0.00	0.01
					Fv/Fm	0.01	LTM	14.10	0.00	0.00
SD_1DPF	4	At2g36390	83.33	4.56	EL	0.07	SAD12	17.50	0.00	0.01
					Fv/Fm	0.03	LTM	12.20	0.00	0.01
LD_1DPF	4	At2g36390	83.33	4.76	EL	0.07	SAD12	18.20	0.00	0.01
					Fv/Fm	0.05	LTM	13.90	0.00	0.01

SD ; short day, LD ; long day, CA ; cold acclimation, FT ; freezing treatment, 1DF : 1 day post freezing treatment