

Eco-physiological traits related to recovery from complete submergence in the model legume *Lotus japonicus*

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SUPPLEMENTARY MATERIAL

Table S1. Plant dry mass (g per plant) of 12 genotypes of *Lotus japonicus* (10 recombinant inbred lines and their parents Gifu and MG20) harvested along the experiment. Values are means \pm standard errors of 6-8 replicates.

Genotype	Initial	After one-week submergence		After one-week recovery		After two-week recovery	
	Control	Control	Submerged	Control	Submerged	Control	Submerged
RIL-6	0.45 \pm 0.08	0.68 \pm 0.07	0.59 \pm 0.05	0.83 \pm 0.12	0.76 \pm 0.08	1.80 \pm 0.11	0.94 \pm 0.20
RIL-18	0.51 \pm 0.05	0.63 \pm 0.04	0.28 \pm 0.05	1.40 \pm 0.12	0.64 \pm 0.17	1.60 \pm 0.13	0.97 \pm 0.18
RIL-30	0.33 \pm 0.06	0.57 \pm 0.13	0.24 \pm 0.07	0.74 \pm 0.23	0.60 \pm 0.09	0.91 \pm 0.05	0.80 \pm 0.17
RIL-47	0.28 \pm 0.05	0.66 \pm 0.13	0.58 \pm 0.14	1.03 \pm 0.20	0.70 \pm 0.05	1.22 \pm 0.19	0.86 \pm 0.37
RIL-80	0.28 \pm 0.02	0.52 \pm 0.08	0.18 \pm 0.03	0.78 \pm 0.33	0.38 \pm 0.08	1.37 \pm 0.10	0.91 \pm 0.07
RIL-82	0.46 \pm 0.09	0.76 \pm 0.11	0.31 \pm 0.01	1.04 \pm 0.32	0.61 \pm 0.17	1.90 \pm 0.32	0.98 \pm 0.15
RIL-85	0.41 \pm 0.02	0.53 \pm 0.04	0.25 \pm 0.03	0.77 \pm 0.11	0.47 \pm 0.06	0.99 \pm 0.15	0.69 \pm 0.05
RIL-176	0.22 \pm 0.06	0.31 \pm 0.03	0.14 \pm 0.02	0.84 \pm 0.22	0.31 \pm 0.09	2.29 \pm 0.45	0.84 \pm 0.17
RIL-189	0.33 \pm 0.07	0.45 \pm 0.06	0.21 \pm 0.05	0.94 \pm 0.22	0.50 \pm 0.10	1.75 \pm 0.46	1.24 \pm 0.17
RIL-200	0.25 \pm 0.06	0.36 \pm 0.06	0.13 \pm 0.02	0.94 \pm 0.12	0.28 \pm 0.03	1.28 \pm 0.11	0.66 \pm 0.10
Gifu	0.14 \pm 0.02	0.30 \pm 0.05	0.15 \pm 0.02	0.58 \pm 0.04	0.23 \pm 0.04	0.93 \pm 0.17	0.46 \pm 0.08
MG20	0.54 \pm 0.10	0.80 \pm 0.15	0.45 \pm 0.08	1.46 \pm 0.10	0.90 \pm 0.33	2.39 \pm 0.34	1.01 \pm 0.20

Table S2. Leaf relative water content (RWC; %) on the top-most fully expanded leaves of control plants of *Lotus japonicus* recombinant inbred lines (RIL) and the parental MG20 and Gifu. Values are means \pm standard errors of 5 replicates. For further details see Materials and methods section.

Genotype	Values for control plants			
	LRWC (%) after 2-d of recovery	LRWC (%) after 7-d of recovery	LRWC (%) after 10-d of recovery	LRWC (%) after 14-d of recovery
RIL-6	89.2 \pm 1.4	91.4 \pm 1.0	91.0 \pm 1.1	90.8 \pm 0.9
RIL-18	90.8 \pm 0.8	90.4 \pm 1.1	91.8 \pm 1.1	90.4 \pm 0.5
RIL-30	91.2 \pm 1.0	91.0 \pm 1.1	90.4 \pm 1.8	91.0 \pm 1.0
RIL-47	92.0 \pm 1.2	91.2 \pm 1.0	91.0 \pm 1.0	90.4 \pm 0.9
RIL-80	91.2 \pm 0.7	91.6 \pm 1.0	91.4 \pm 0.9	90.2 \pm 0.9
RIL-82	91.4 \pm 0.9	91.1 \pm 1.0	91.8 \pm 1.1	90.8 \pm 1.0
RIL-85	92.4 \pm 1.3	91.6 \pm 0.9	91.0 \pm 1.0	91.8 \pm 0.7
RIL-176	91.2 \pm 1.0	90.2 \pm 1.5	91.2 \pm 1.1	91.8 \pm 0.9
RIL-189	91.2 \pm 1.0	90.2 \pm 1.5	91.2 \pm 1.1	91.8 \pm 0.9
RIL-200	90.4 \pm 1.1	90.0 \pm 0.6	90.0 \pm 0.7	90.6 \pm 1.0
Gifu	91.6 \pm 1.4	92.2 \pm 1.0	90.2 \pm 1.0	91.2 \pm 0.7
MG20	91.6 \pm 1.4	92.0 \pm 0.7	91.4 \pm 0.8	91.4 \pm 1.3
ANOVA for the effect of genotype	<i>p</i> -value: 0.86	<i>p</i> -value: 0.91	<i>p</i> -value: 0.98	<i>p</i> -value: 0.94

Table S3. Stomatal conductance- g_s ($\text{mmol m}^{-2} \text{s}^{-1}$) on the top-most fully expanded leaves of control plants of *Lotus japonicus* recombinant inbred lines (RIL) and the parental MG20 and Gifu. Values are means \pm standard errors of 5 replicates. For further details see Materials and methods section.

Genotype	Values for control plants			
	g_s after 2-d of recovery	g_s after 7-d of recovery	g_s after 10-d of recovery	g_s after 14-d of recovery
RIL-6	194.2 \pm 9.4	191.4 \pm 14.0	198.8 \pm 12.5	200.4 \pm 8.1
RIL-18	189.0 \pm 7.9	187.8 \pm 6.5	194.4 \pm 13.3	200.8 \pm 6.9
RIL-30	189.4 \pm 5.6	199.0 \pm 10.3	187.2 \pm 6.4	194.6 \pm 10.1
RIL-47	201.2 \pm 9.9	191.4 \pm 5.1	196.8 \pm 9.7	201.0 \pm 10.2
RIL-80	197.6 \pm 5.5	198.0 \pm 11.8	198.8 \pm 12.3	202.2 \pm 8.4
RIL-82	199.2 \pm 13.2	197.4 \pm 7.3	203.2 \pm 8.4	199.0 \pm 8.3
RIL-85	194.0 \pm 8.4	192.6 \pm 8.9	196.8 \pm 7.4	204.8 \pm 11.8
RIL-176	197.4 \pm 4.8	193.2 \pm 7.8	200.0 \pm 13.6	208.8 \pm 9.2
RIL-189	204.6 \pm 9.8	199.0 \pm 13.0	203.2 \pm 8.4	200.2 \pm 9.4
RIL-200	200.8 \pm 9.2	198.8 \pm 11.0	193.2 \pm 8.5	198.2 \pm 4.7
Gifu	203.2 \pm 8.1	202.0 \pm 8.0	199.0 \pm 13.7	193.4 \pm 7.7
MG20	199.8 \pm 9.8	199.0 \pm 8.9	204.2 \pm 12.8	205.8 \pm 7.0
ANOVA for the effect of genotype	p -value: 0.82	p -value: 0.97	p -value: 0.93	p -value: 0.96

Table S4. Dark-adapted chlorophyll fluorescence (Fv/Fm) on the top-most fully expanded leaves of control plants of *Lotus japonicus* recombinant inbred lines (RIL) and the parental MG20 and Gifu. Values are means \pm standard errors of 5 replicates. For further details see Materials and methods section.

Genotype	Values for control plants		
	Fv/Fm after 2-d of recovery	Fv/Fm after 7-d of recovery	Fv/Fm after 11-d of recovery
RIL-6	0.810 \pm 0.004	0.808 \pm 0.006	0.807 \pm 0.004
RIL-18	0.810 \pm 0.007	0.808 \pm 0.006	0.804 \pm 0.009
RIL-30	0.816 \pm 0.006	0.803 \pm 0.005	0.814 \pm 0.009
RIL-47	0.807 \pm 0.006	0.806 \pm 0.006	0.814 \pm 0.005
RIL-80	0.810 \pm 0.009	0.805 \pm 0.005	0.811 \pm 0.004
RIL-82	0.810 \pm 0.009	0.805 \pm 0.005	0.810 \pm 0.004
RIL-85	0.810 \pm 0.004	0.807 \pm 0.007	0.813 \pm 0.007
RIL-176	0.808 \pm 0.004	0.810 \pm 0.005	0.808 \pm 0.004
RIL-189	0.812 \pm 0.009	0.808 \pm 0.008	0.809 \pm 0.004
RIL-200	0.808 \pm 0.004	0.810 \pm 0.005	0.808 \pm 0.004
Gifu	0.807 \pm 0.007	0.806 \pm 0.006	0.806 \pm 0.010
MG20	0.807 \pm 0.006	0.811 \pm 0.003	0.810 \pm 0.007
ANOVA for the effect of genotype	<i>p</i> -value: 0.93	<i>p</i> -value: 0.94	<i>p</i> -value: 0.96

Table S5. Greenness (SPAD units) of basal and apical young fully expanded leaves of control plants of *Lotus japonicus* recombinant inbred lines (RIL) and their parental MG20 and Gifu. Values are means \pm standard errors of 5 replicates. For further details see Materials and methods section.

Genotype	Values for controls – Basal leaves			
	Greenness 2-d of recovery	Greenness 7-d of recovery	Greenness 10-d of recovery	Greenness 14-d of recovery
RIL-6	33.6 \pm 1.3	35.4 \pm 1.4	35.8 \pm 1.7	34.2 \pm 1.5
RIL-18	35.6 \pm 2.1	36.4 \pm 2.2	35.2 \pm 2.0	34.2 \pm 1.5
RIL-30	35.2 \pm 2.7	37.0 \pm 1.6	35.8 \pm 2.2	36.4 \pm 2.1
RIL-47	35.2 \pm 2.9	36.4 \pm 2.1	36.8 \pm 2.0	34.8 \pm 2.2
RIL-80	34.8 \pm 2.4	36.2 \pm 2.2	36.2 \pm 1.5	36.0 \pm 1.4
RIL-82	35.2 \pm 1.8	35.6 \pm 2.7	36.0 \pm 2.2	35.2 \pm 2.0
RIL-85	34.2 \pm 2.7	35.0 \pm 2.4	35.8 \pm 2.3	36.4 \pm 1.8
RIL-176	35.0 \pm 1.6	35.2 \pm 2.4	34.8 \pm 2.1	35.2 \pm 2.3
RIL-189	35.0 \pm 2.1	34.8 \pm 2.4	36.6 \pm 1.7	36.2 \pm 1.8
RIL-200	35.2 \pm 2.1	37.4 \pm 2.1	37.6 \pm 1.3	35.2 \pm 2.1
Gifu	36.6 \pm 2.0	35.6 \pm 2.0	35.0 \pm 2.4	36.4 \pm 2.4
MG20	35.6 \pm 1.7	35.4 \pm 2.0	37.6 \pm 1.4	36.0 \pm 2.4
ANOVA for the effect of genotype	<i>p</i> -value: 0.89	<i>p</i> -value:0.90	<i>p</i> -value:0.88	<i>p</i> -value:0.87
Genotype	Values for controls – Greenness of apical fully-expanded leaves			
	Greenness 2-d of recovery	Greenness 7-d of recovery	Greenness 10-d of recovery	Greenness 14-d of recovery
RIL-6	43.2 \pm 0.6	43.0 \pm 1.0	42.0 \pm 1.3	42.6 \pm 1.1
RIL-18	41.8 \pm 0.9	41.6 \pm 0.8	41.0 \pm 0.7	41.8 \pm 1.0
RIL-30	42.0 \pm 1.0	41.8 \pm 1.4	41.6 \pm 1.2	41.8 \pm 1.2
RIL-47	42.0 \pm 1.0	41.8 \pm 1.2	42.6 \pm 1.0	41.4 \pm 1.4
RIL-80	41.6 \pm 1.2	42.0 \pm 0.7	42.0 \pm 0.9	42.0 \pm 1.1
RIL-82	41.6 \pm 0.9	42.6 \pm 0.5	42.0 \pm 1.0	42.6 \pm 0.6
RIL-85	43.0 \pm 0.3	42.2 \pm 1.1	41.0 \pm 0.5	42.6 \pm 0.9
RIL-176	41.8 \pm 1.1	42.4 \pm 1.0	42.2 \pm 0.6	42.8 \pm 0.7
RIL-189	42.0 \pm 0.8	43.4 \pm 0.6	42.6 \pm 1.1	42.2 \pm 1.0
RIL-200	41.6 \pm 0.8	42.0 \pm 1.2	42.4 \pm 0.9	42.0 \pm 1.2
Gifu	42.4 \pm 1.1	43.0 \pm 1.0	42.0 \pm 0.9	42.8 \pm 1.0
MG20	41.6 \pm 0.9	43.0 \pm 1.0	43.0 \pm 1.1	42.2 \pm 1.1
ANOVA for the effect of genotype	<i>p</i> -value:0.88	<i>p</i> -value:0.89	<i>p</i> -value:0.87	<i>p</i> -value:0.91



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