

***New Phytologist* Supporting Information Tables S1–S5 and Figs S1 & S2**

Article title: Oxygen deficiency and salinity affect cell-specific ion concentrations in adventitious roots of barley (*Hordeum vulgare*)

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The following Supporting Information is available for this article:

Table S1 Composition of nutrient solution used in experiments

Full strength composition
Macronutrients (mM): K ⁺ , 5.95; Ca ²⁺ , 1.5; Mg ²⁺ , 0.4; NH ₄ ⁺ , 0.625; NO ₃ ⁻ , 4.375; SO ₄ ²⁻ , 1.9; H ₂ PO ₄ ⁻ , 0.2; and also Na ⁺ , 0.2; SiO ₃ ²⁻ , 0.1;
Micronutrients (μM): Cl ⁻ , 50; B, 25; Mn ²⁺ , 2; Zn ²⁺ , 2; Ni ²⁺ , 1; Cu ²⁺ , 0.5; Mo 0.5; Fe-EDTA, 50;
Solution also contained 2.5 mM MES (2-[<i>N</i> -morpholino]ethanesulfonic acid);
pH adjusted to 6.5 using KOH (to give final concentration as above);
FeSO ₄ at 5 μM was added at week 1 to prevent symptoms of slight Fe deficiency that could otherwise occur.

Table S2 Strength of nutrient solution during experiment

Plant age (d)	Solution strength (%)
0 to 4	10
4 to 7	25
>7	100

Table S3 Growth of barley (*Hordeum vulgare* var. Franklin) in aerated, aerated saline (100 mM NaCl), stagnant or stagnant saline (100 mM NaCl) nutrient solution. Plants were raised in aerated nutrient solution for 14 d prior to the treatments being imposed for 14 d at 25 : 20°C, day : night temperatures. All values are means ($n = 4$) \pm SE. Significant levels of $P < 0.01$ or $P < 0.001$ are denoted by ** or ***, respectively (two-sample test).

Parameter	Aerated non-saline	Aerated saline	% of control	Stagnant non-saline	% of control	Stagnant saline	% of control
Shoot dry mass (g)	1.28 \pm 0.09	0.75 \pm 0.04**	59	0.47 \pm 0.03***	36	0.31 \pm 0.02***	24
Tiller number	10.3 \pm 0.3	5.8 \pm 0.3***	56	5.3 \pm 0.3***	51	4 \pm 0***	39
Root dry mass (g)	0.36 \pm 0.01	0.23 \pm 0.03**	64	0.10 \pm 0.008***	28	0.07 \pm 0.006***	20
Adventitious root number	20 \pm 1.2	13 \pm 1**	65	23 \pm 1.4	115	12.5 \pm 1**	63

Table S4 K : Na ratio in shoots and seminal roots of barley (*Hordeum vulgare* var. Franklin) grown in aerated non-saline, aerated saline (100 mM NaCl), stagnant non-saline or stagnant saline (100 mM NaCl) nutrient solutions for the final 14 d. Different letters indicate significant difference among treatments ($P < 0.05$; Tukey test). Data are means \pm SE ($n = 3$).

Treatment	K : Na ratio	
	Shoots	Seminal roots
Aerated non-saline	4.4 \pm 0.01 ^a	4.7 \pm 0.07 ^a
Aerated saline	0.7 \pm 0.05 ^b	0.7 \pm 0.08 ^b
Stagnant non-saline	4.2 \pm 0.3 ^a	2.9 \pm 0.2 ^c
Stagnant saline	0.3 \pm 0.02 ^b	0.4 \pm 0.05 ^b

Table S5 Absolute root area and percentage area of stele in cross-sections taken 10 and 50 mm from the root apex of 60–100 mm adventitious roots of barley (*Hordeum vulgare* var. Franklin) grown in aerated, aerated saline (100 mM NaCl), stagnant or stagnant saline (100 mM NaCl) nutrient solution. Plants were raised in aerated nutrient solution for 14 d before the treatments being imposed for 14 d. Different letters indicate significant differences among treatments within positions ($P < 0.05$; Tukey’s multiple comparisons test). Data are means ($n = 3$) \pm SE.

	Root area in cross-section (mm ²)		Stele area in root cross-section (%)	
	10 mm	50 mm	10 mm	50 mm
Aerated non-saline	0.43 \pm 0.02 ^{ac}	0.54 \pm 0.05 ^{ab}	8.6 \pm 0.2 ^{ab}	9.8 \pm 0.4 ^a
Aerated saline	0.49 \pm 0.02 ^a	0.46 \pm 0.01 ^a	8.0 \pm 0.5 ^{ab}	8.3 \pm 1.0 ^a
Stagnant non-saline	0.67 \pm 0.04 ^b	0.68 \pm 0.00 ^b	7.6 \pm 0.6 ^a	9.8 \pm 0.7 ^a
Stagnant saline	0.34 \pm 0.02 ^c	0.56 \pm 0.01 ^{ab}	9.4 \pm 0.1 ^b	10.6 \pm 0.6 ^a

Fig. S1 Relative growth rate (RGR) of barley (*Hordeum vulgare* var. Franklin) shoots and roots in plants grown in aerated non-saline, aerated saline (100 mM NaCl), stagnant non-saline or stagnant saline (100 mM NaCl) nutrient solutions for the final 14 d at 25 : 20°C, day : night temperatures. Whole plant relative growth rate (RGR) was calculated from the dry mass data (weight of dead leaves included) at the initial and final samplings. Different letters indicate significant differences among treatments ($P < 0.05$; Tukey test). Data are means \pm SE ($n = 4$).

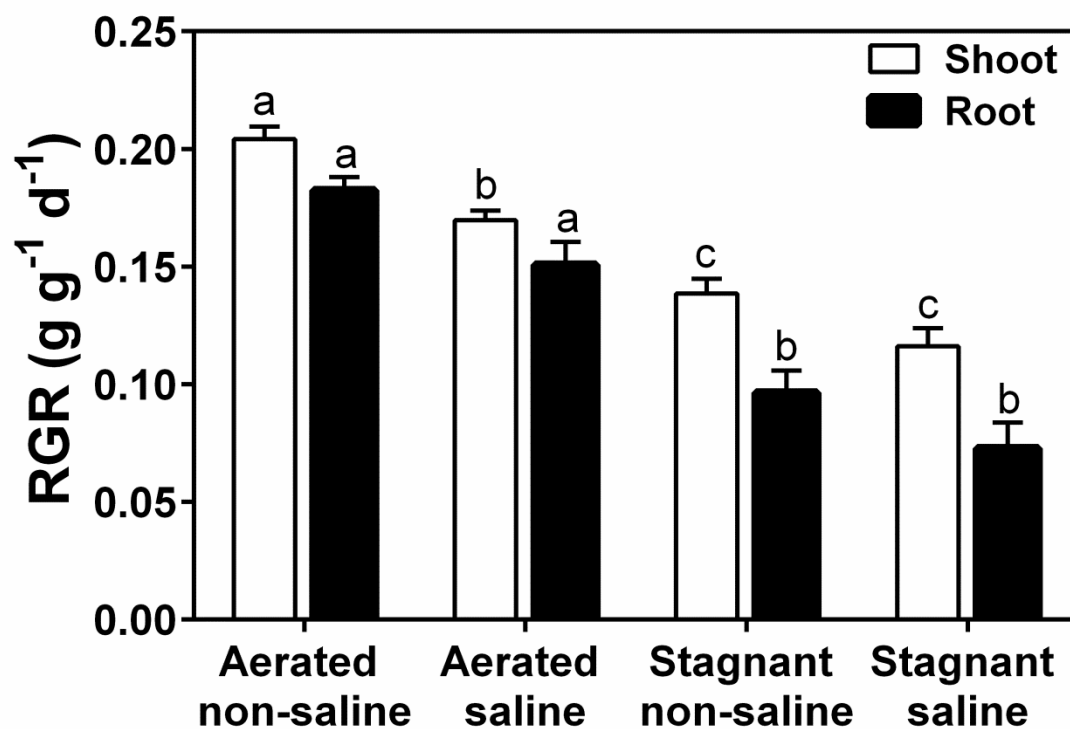


Fig. S2 Concentrations of K, Na and Cl in seminal roots (a) and shoots (b) of barley (*Hordeum vulgare* var. Franklin) grown in aerated non-saline, aerated saline (100 mM NaCl), stagnant non-saline or stagnant saline (100 mM NaCl) nutrient solution for the final 14 d at 25 : 20°C, day : night temperatures. Tissues were extracted and then analysed using a flame photometer and chloridometer, and data expressed on a tissue water basis. Different letters indicate significant differences among treatments within shoots or seminal roots ($P < 0.05$; Tukey test). Data are means \pm SE ($n = 3$).

