

Supplementary Material

Introgression of QTLs for constitutive aerenchyma formation from *Zea nicaraguensis* improves tolerance of root-zone oxygen deficiency in maize

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Chromosome 7								Chromosome 8								Chromosome 9						Chromosome 10											
A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A

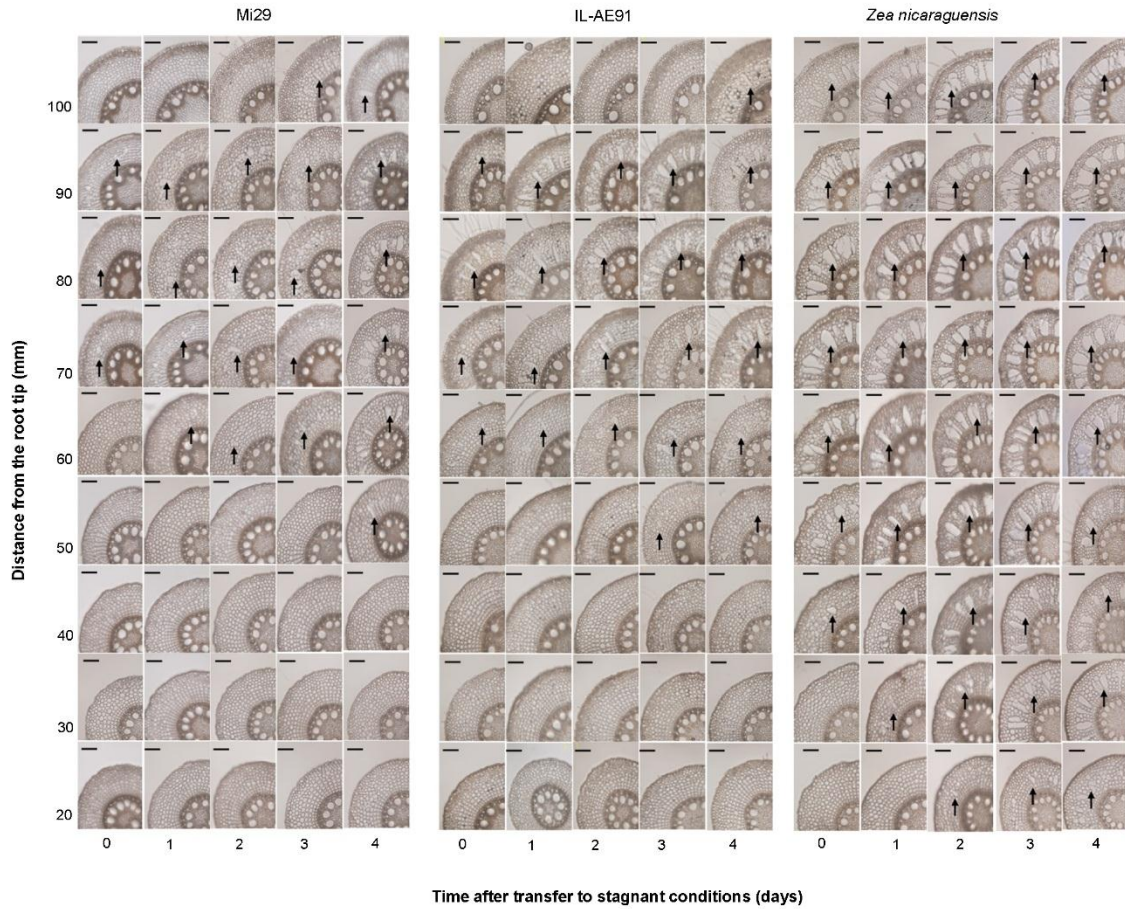


Figure S1. Cross-sections of Mi29, IL-AE91 and *Z. nicaraguensis* roots under stagnant deoxygenated conditions. Seedlings with around 100 mm long 4th nodal roots grown under aerated conditions were transferred to stagnant deoxygenated conditions for four days (days 0, 1, 2, 3 and 4). Distances from the root tip (mm) are displayed on the left side of figures. Arrows indicate aerenchyma. Bar = 100 μ m.

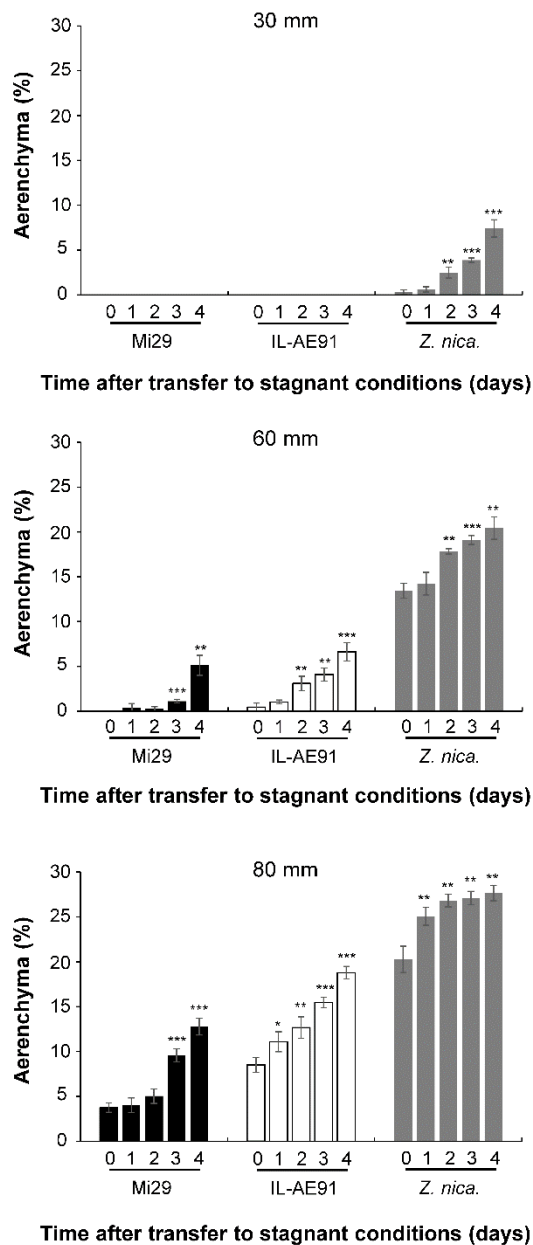


Figure S2. Aerenchyma formation at 30 mm, 60 mm and 80 mm from the root tips of Mi29, IL-AE91 and *Z. nicaraguensis* (*Z. nica.*) roots under stagnant deoxygenated conditions for four days (days 0, 1, 2, 3 and 4). Data was selected from Figure 6. Statistical analyses were performed using one-way ANOVA followed by Dunnett's multiple comparisons test. *, ** and *** indicate significant differences between the value of each line at day 0 and those of days 1-4 at the $P < 0.05$, $P < 0.01$ and $P < 0.001$ levels, respectively.

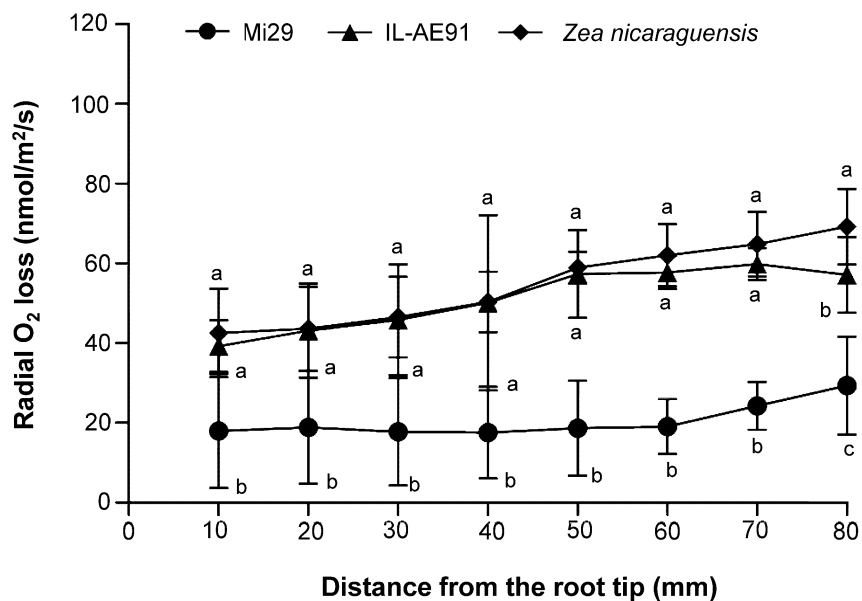


Figure S3. ROL from aerobically grown roots of Mi29, IL-AE91 and *Z. nicaraguensis* on day 4 under stagnant deoxygenated conditions. Different letters indicate significant difference within each line at each root position ($P < 0.05$, one-way ANOVA and then Tukey's test for multiple comparisons). Values are means \pm SD ($n = 3$).

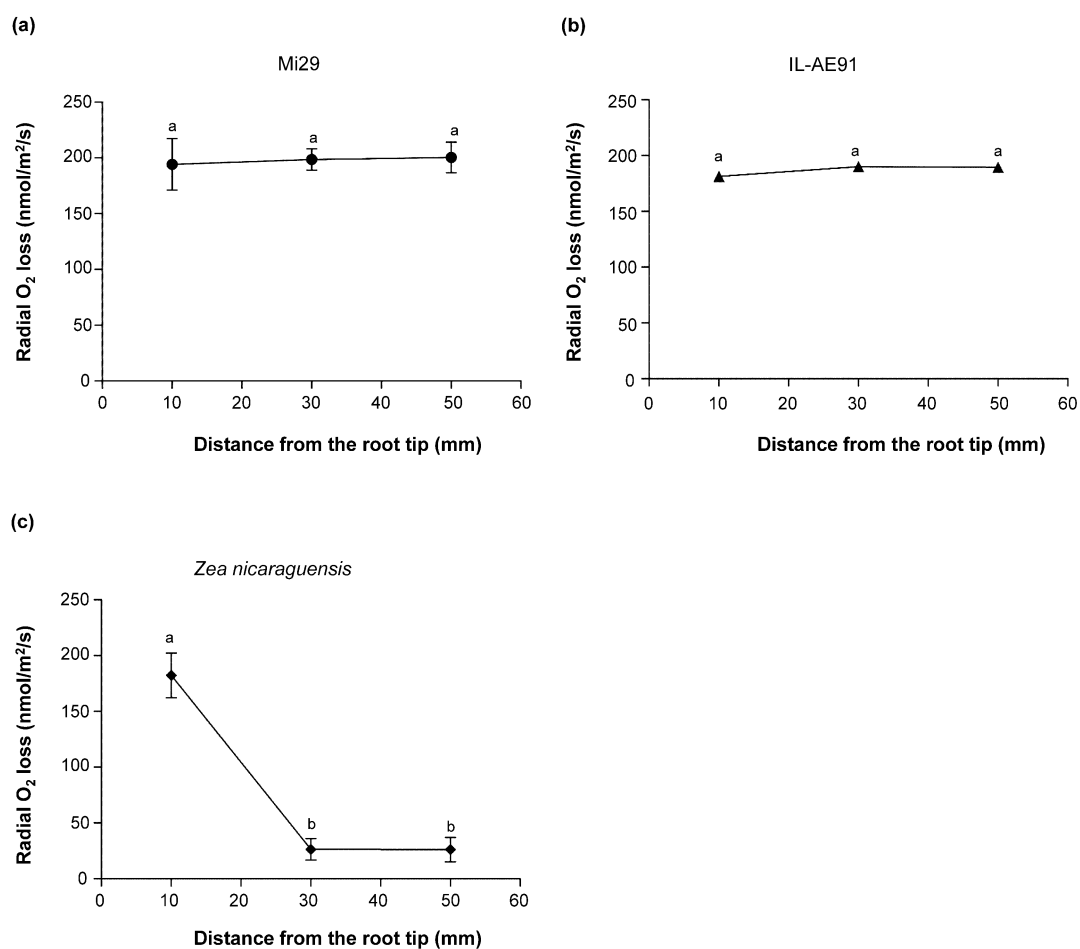


Figure S4. ROL from roots of Mi29, IL-AE91 and *Z. nicaraguensis* emerged after transfer to stagnant deoxygenated conditions. The total root lengths were 40-60 mm. Three root points including root tip (5-10 mm from the root tips), root middle (25-30 mm from the root tips) and root base (45-50 mm from the root tips) were used to measure the ROL amount. Different letters indicate significant difference between distances ($P < 0.05$, one-way ANOVA and then Tukey's test for multiple comparisons). Values are means \pm SD ($n = 3$).