

Supplementary Material

Fundamental parenchyma cells are involved in Na⁺ and Cl⁻ removal ability in rice leaf sheath

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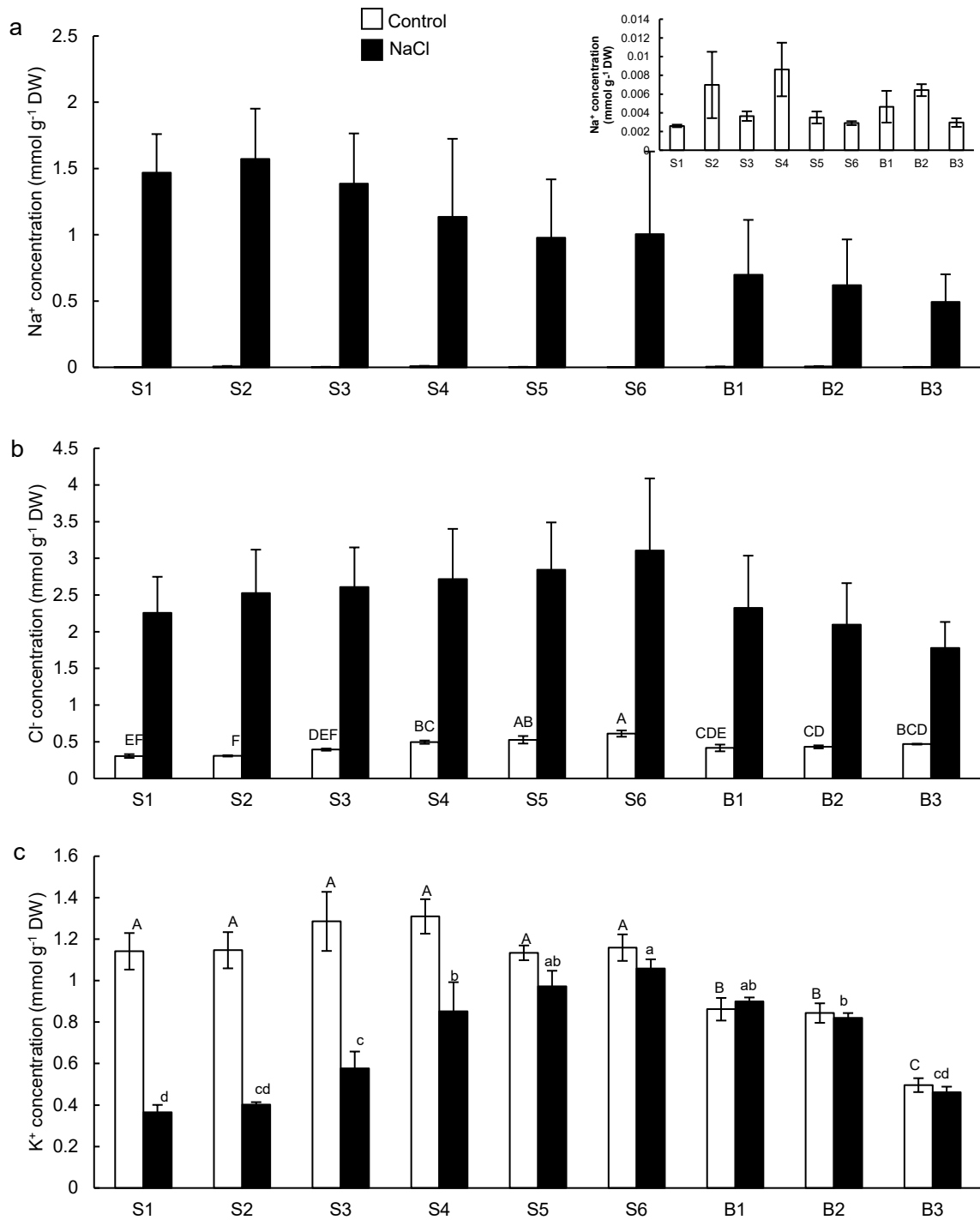


Fig. S1. Na⁺, Cl⁻ and K⁺ concentrations along the longitudinal axis of 5th leaves of IR29 under control or treatment conditions with 100 mM NaCl. (a) Na⁺. (b) Cl⁻. (c) K⁺. S1 to 6: from the basal to upper parts of leaf sheaths, B1 to 3: from the basal to upper parts of leaf blades. Data are mean of three replications ± standard error. Different letters indicate significant differences among nine parts under same conditions at $P < 0.05$ (Tukey's multiple comparison test).

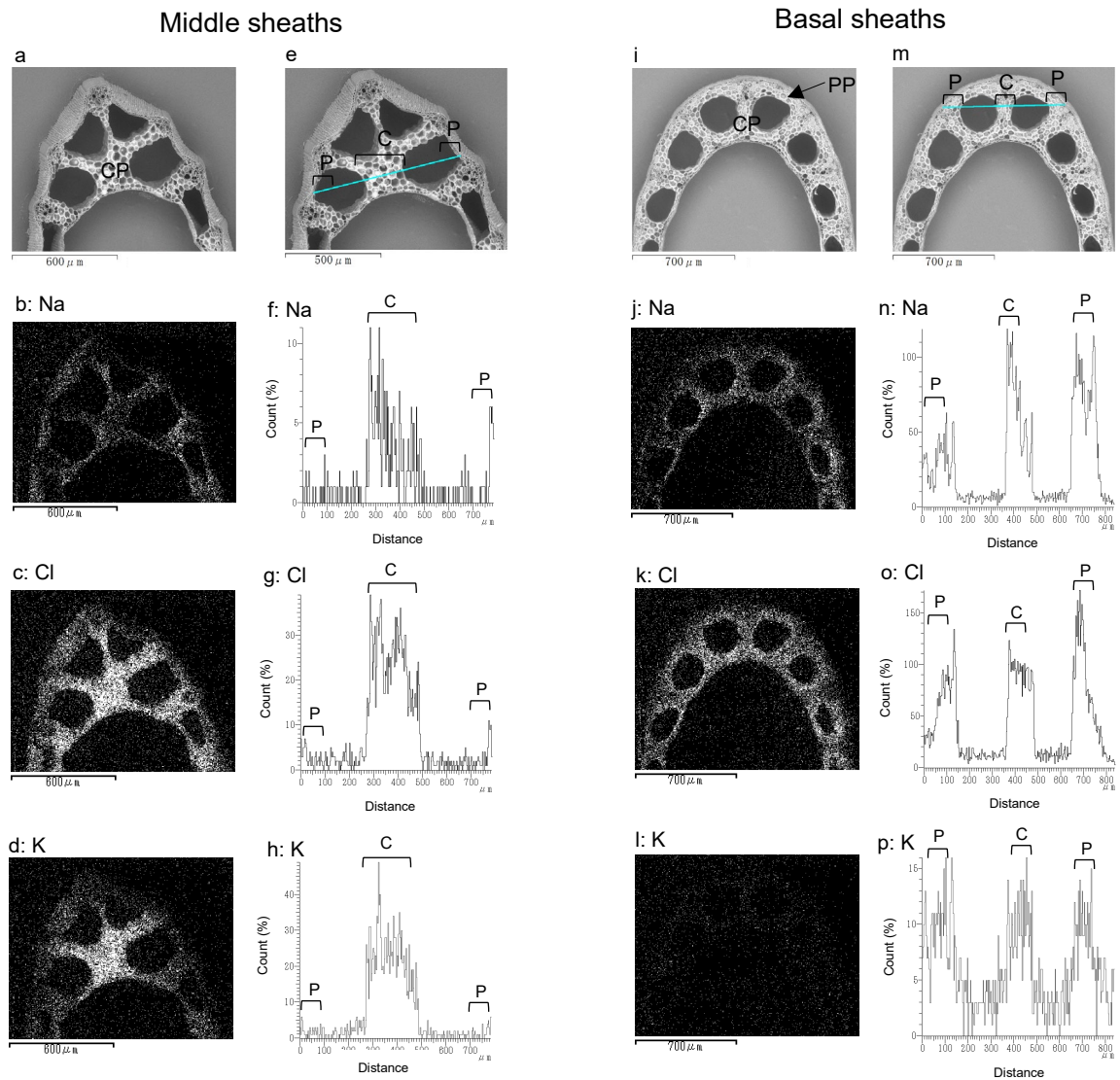


Fig. S2. X-ray mapping, line scan and scanning electron microscope images of the cross sections of the middle and basal part of leaf sheaths of IR29 under NaCl-treated conditions using an energy-dispersive X-ray spectroscope attached with a scanning electron microscope. Two-week-old rice seedlings were treated with 100 mM NaCl for 7 days, and the fifth leaves were used for the analysis. (a) A scanning electron microscope image of middle leaf sheaths, (b), (c), and (d) Corresponding X-ray mapping profiles of Na, Cl and K. (e) Scanning electron microscope image of middle leaf sheaths, (f), (g), and (h) line scan profiles of Na, Cl and K distributions. (i) A scanning electron microscope image of basal leaf sheaths, (j), (k), and (l) Corresponding X-ray mapping profiles of Na, Cl and K. (m) Scanning electron microscope image of basal leaf sheaths, (n), (o), and (p) line scan profiles of Na, Cl and K distributions, respectively. CP, central parenchyma cells; PP, peripheral parenchyma cells; P, peripheral; C, center. Arrowheads indicate vasculatures.

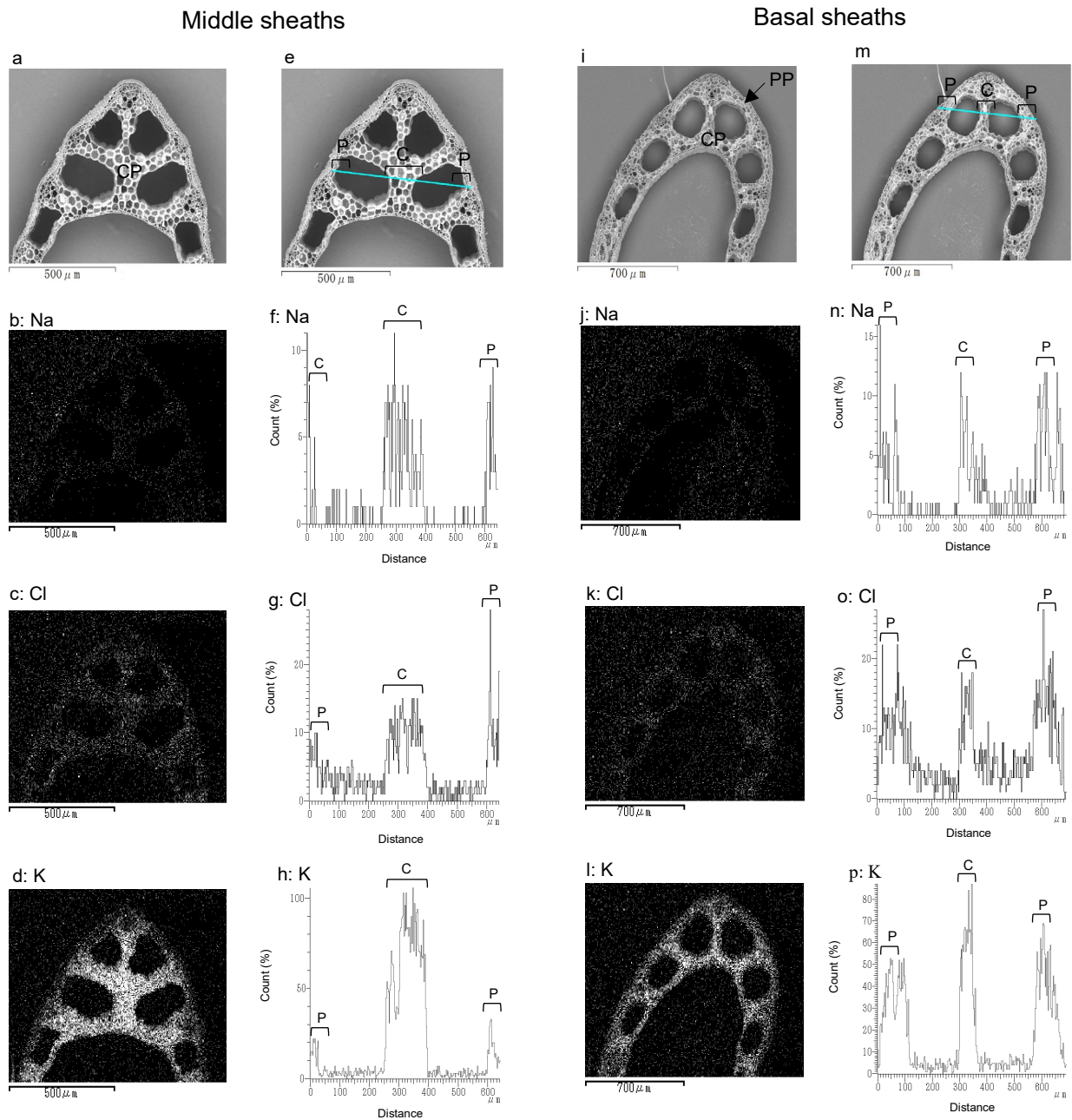


Fig. S3. X-ray mapping, line scan and scanning electron microscope images of the cross sections of the middle and basal part of leaf sheaths of IR29 under control conditions using an energy-dispersive X-ray spectroscope attached with a scanning electron microscope. Two-week-old rice seedlings were treated with 100 mM NaCl for 7 days, and the fifth leaves were used for the analysis. (a) A scanning electron microscope image of middle leaf sheaths, (b), (c), and (d) Corresponding X-ray mapping profiles of Na, Cl and K. (e) Scanning electron microscope image of middle leaf sheaths, (f), (g), and (h) line scan profiles of Na, Cl and K distributions. (i) A scanning electron microscope image of basal leaf sheaths, (j), (k), and (l) Corresponding X-ray mapping profiles of Na, Cl and K. (m) Scanning electron microscope image of basal leaf sheaths, (n), (o), and (p) line scan profiles of Na, Cl and K distributions, respectively. CP, central parenchyma cells; PP, peripheral parenchyma cells; P, peripheral; C, center. Arrowheads indicate vasculatures.

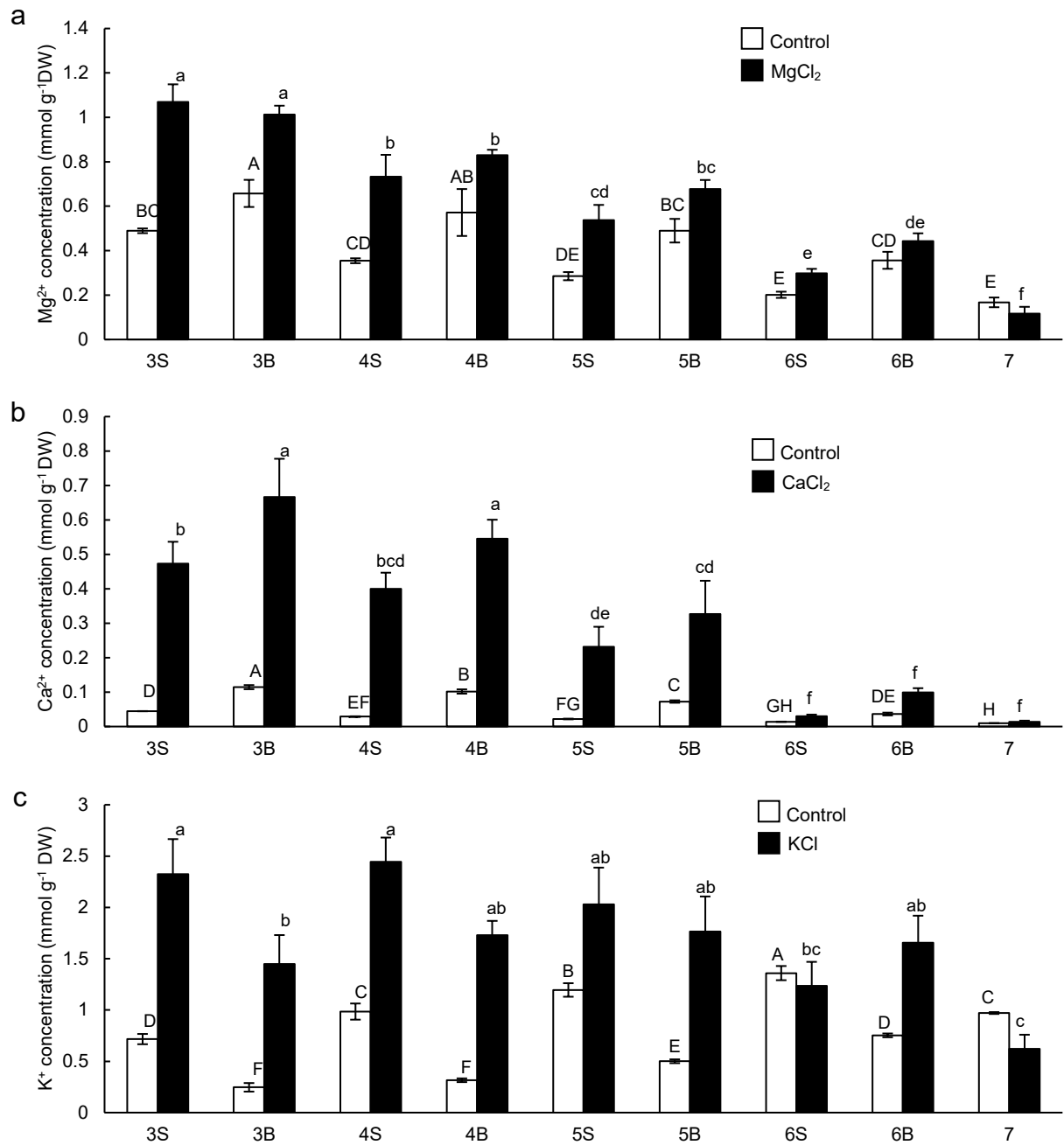


Fig. S4. Mg²⁺, Ca²⁺ and K⁺ concentrations in leaf sheaths and blades of IR29. (a) Mg²⁺. (b) Ca²⁺. (c) K⁺. Two-week-old seedlings were grown under the control or treatment with either 20 mM MgCl₂ (a), 20 mM CaCl₂ (b) or 100 mM KCl (c) for 1 week. 3S, 3rd leaf sheath; 3B, 3rd leaf blade; 4S, 4th leaf sheath; 4B, 4th leaf blade; 5S, 5th leaf sheath; 5B, 5th leaf blade; 6S, 6th leaf sheath; 6B, 6th leaf blade; 7, the youngest expanded 7th leaf. Data are mean of three replications ± standard error. Different letters indicate significant differences among nine parts under same conditions at *P* < 0.05 (Tukey's multiple comparison test).