Received: 1 April 2023 | Revised: 16 October 2023 | Accepted: 23 October 2023

DOI: 10.1111/jac.12679

SALINITY STRESS

Journal of Agronomy and Crop Science WILEY

Traits contributing to salinity tolerance in rice genotypes from the Mekong Delta

Kristian Johnson[1] | Duy Hoang Vu[2] | Folkard Asch[1]

[1]University of Hohenheim, Stuttgart, Germany

[2]Vietnam Academy of Agriculture, Hanoi, Vietnam

Correspondence
Folkard Asch, Department of Management of Crop Water Stress in the Tropics and Subtropics (490g), University of Hohenheim, Garbenstr 13, Stuttgart 70599, Germany.
Email: fa@uni-hohenheim.de

Funding information
Bundesministerium für Bildung und Forschung, Anton & Petra Ehrmann-Stiftung, Project Management Organization Jülich, Grant/Award Number: 031B0724

Abstract

Increasing sea level rise and subsequent salinization in mega deltas, such as the Vietnamese Mekong Delta (VMD), pose a risk to rice (*Oryza sativa* L.) production during the dry season. This study investigated the salinity resistance of a selection of common rice genotypes from the VMD along with an international check, IR64. The 20 rice varieties were grown hydroponically for 5 weeks in a greenhouse and then exposed to three levels of NaCl concentration (0 mM, 50 mM and 100 mM) over a period of 2 weeks to determine their susceptibility to salinity. Rice plants were scored and SPAD (leaf greenness) and PRI (photochemical reflectance index) were measured on the youngest fully developed leaf on the main tiller. After harvesting the 7-week-old plants, biomass and ion (K^+, Cl^-, Na^+) content were determined by organ across all tillers. Averaged over all varieties, both at 50 mM and 100 mM NaCl, there was a significant reduction in plant biomass, 39% and 52% respectively. However, the effect of the NaCl treatments and the uptake of Cl^- and Na^+ were significantly different between varieties ($p < .0001$). Using biomass and ion content as part of a multivariate analysis, varieties were classified according to their susceptibility to salinity and their predominant strategy towards managing ion accumulation. The grouped varieties were further characterized by patterns in Cl^- and Na^+ partitioning and nondestructive parameters such as SPAD and PRI.

KEYWORDS
ion partitioning, Mekong delta, salinity tolerance

Key points

- There was significant variation in genotypic response to NaCl at 50 mM and 100 mM NaCl.
- This was due to differences in morphology and ion (Cl^-, Na^+, K^+) uptake that shifted depending on treatment severity.
- With multivariate analysis we determined tolerance and patterns in ion partitioning.
- Accordingly, we were able to identify salt-tolerant varieties already adapted to the Mekong Delta.

1 | INTRODUCTION

For much of the world's population, rice (*Oryza sativa* L.) is an essential daily staple (Pandey, 2010). However, to satisfy global demand, and with most arable land exploited (Kendall & Pimental, 1994), areas already under cultivation need to not only be maintained but also become more productive. Seck et al. (2012) predict that compared to the amount of milled rice produced in 2009, an additional 116 million tons will be needed in 2035. The challenge is particularly acute in Asian Mega Deltas, as agricultural land is rapidly being degraded due to urbanization, erosion and soil salinization (Hossain et al., 2020; Schneider & Asch, 2020). Although salinization is typically the result of poor agricultural practice in arid areas, it is increasingly a problem in some of the world's wettest regions due to climate change (Yeo, 1998). In Asia's mega deltas, such as the Vietnam Mekong Delta (VMD), sea level rise (Adamson & Bird, 2010) and less predictable rainfall (Dang et al., 2020) cause field salinization further inland, especially during severe dry seasons, such as in 2016 (Sebastian et al., 2016). Land use and climate change trends indicate that saline intrusion may become a permanent feature of the VMD particularly during the dry season (Eslami et al., 2021), which puts rice production in the region at risk (Khang et al., 2008).

Rice is a fundamentally salt-susceptible crop (Grattan et al., 2002). Salinity stress relates to two processes. Initially, high concentrations of salt make it more difficult for the roots to take up water. This is subsequently followed by a toxic accumulation of salts within the plant (Horie et al., 2012; Munns & Tester, 2008). The path through the rice plant that both Na^+ and Cl^- follow is the same as that of water, and its speed and degree of accumulation is primarily dictated by transpiration (Asch et al., 1995; Shelke et al., 2019). This might suggest a passive process, but rice plants, similar to other grass species such as wheat (Davenport et al., 2005) or sorghum (Netondo et al., 2004), use a combination of strategies to mitigate salinity stress with varying success. These include increased vigour, the redistribution of ions into older tissue followed by senescence, osmotic adjustment, or the avoidance of it all together through selective water and ion uptake (Asch et al., 1997; Horie et al., 2012; Munns & Tester, 2008). The effects of Cl^- are less understood, although it is considered less toxic than Na^+ at higher concentrations and is similarly managed at a cellular and plant level (Lutts et al., 1996; Shelke et al., 2019). However, salinity susceptibility varies not only between species but also between rice genotypes (Lutts et al., 1996; Moradi & Ismail, 2007) and rice development stages (Khatun & Flowers, 1995; Lutts et al., 1995). Its effect is amplified or mitigated by climactic conditions such as temperature and vapour pressure deficit (Asch et al., 1995).

The time needed to develop new, more salinity-tolerant rice varieties continues to decrease and can be as short as 2–3 years (Gregorio et al., 2013). However, their adoption by farmers in areas at increasing risk of salinity intrusion can be slow due to differences in morphology and grain quality compared to commonly grown varieties (Chi et al., 2015). Therefore, screening varieties that are currently adopted by farmers in the VMD, and that have proven economic value, are the best starting point as a limited, short-term management option. In the longer term it also forms the foundation for further genetic improvement by identifying useful traits in locally adapted varieties. The objectives of this study were (a) to investigate the effect of varying levels of salinity during the vegetative stage of commonly grown varieties in the VMD along with an international check variety, IR64, and (b) through a flexible approach based on multivariate analysis of ionic and physiological parameters, classify varieties according to susceptibility and their predominant mechanism of salinity adaptation.

2 | MATERIALS AND METHODS

2.1 | Experimental site

The experiment was conducted in a greenhouse at the Institute of Agricultural Science in the Tropics, University of Hohenheim, Stuttgart, Germany from February to April 2021. Over the course of the experiment, the mean temperature and humidity was 30 ± 4°C and 36 ± 4% during the day and 25 ± 1°C and 41 ± 1% at night. At canopy level, the average light intensity was 450 μmol m^{-2} s^{-1}.

2.2 | Rice genotypes

This experiment tested rice varieties from across the VMD as well as IR64, an international *indica* check. We selected varieties based on several interviews with farmers across the VMD. These were complemented by varieties with known salinity tolerance from representatives of Loc Trio Group, Cuu Long Delta Rice Research Institute and Kien Giang University. In general, all are short-duration (~90 days to maturity), short, non-photoperiod sensitive, high-yielding, mostly *indica* varieties. More information on each variety is available in Appendix 1 and in Johnson et al. (2023).

2.3 | Seedling germination and early growth

The rice seeds were first washed and then soaked for 24 h. in tap water. They were then placed 2 cm deep in washed sand. Two weeks after sowing, similarly vigorous seedlings of each variety were selected. Sand was carefully cleaned from their roots, and they were placed in plastic foam collars. Each seedling was placed in a labelled PVC tube, with the foam snugly holding the seedling in place at the top of each tube, while the other end extended to the bottom of the box, keeping the roots of each plant separated.

2.4 | Hydroponic system

We used a flow-through hydroponic system for this experiment. For each salinity treatment, nutrient solution in a 60-L barrel was pumped with a 1500 L h^{-1} pump (Shenzhen Xinqiao Trading Ltd.) into three 10-L plastic boxes (Auer, Germany) containing 58 plants.

Opposite to where nutrient solution was pumped into the box, nutrient solution passively exited via a hose that fed back into the barrel of nutrient solution below. As part of a separate simultaneously running loop, nutrient solution was pumped into a water temperature regulator and maintained at 25°C. In total, there were three systems, comprising nine boxes and three barrels. The flow rate was maintained at an average of $4\,L\,m^{-1}$.

2.5 | Nutrient solution

We used a modified Yoshida solution (Yoshida et al., 1976), which chelates iron with EDTA instead of dissolving Fe^{2+} in sulfuric acid. Before adding it to the hydroponic system, the pH of the solution was adjusted to around 5.0. The nutrient solution for all hydroponic systems was changed once a week, and pH was regularly monitored, although not adjusted. For the first 2 weeks after transplanting seedlings into the hydroponic system, half-strength nutrient solution was used.

2.6 | Experiment setup

The two-week salinity treatment started 3 weeks after the seedlings had been transplanted into the hydroponic system. The NaCl treatments were as follows: 0 mM, 50 mM and 100 mM. The treatment solution was created by adding NaCl to 60 L of nutrient solution. It was replaced with a new salinized nutrient solution after 7 days. To maintain a consistent salinity level, we marked the water level inside the barrel when the treatment solution was freshly prepared and added deionized water to maintain it at that level. Furthermore, we monitored EC in each treatment daily. For each salinity treatment (0, 50, 100 mM NaCl), there were three replications (or boxes), and each replication contained three repetitions of each variety. However, due to space constraints there was one less repetition distributed across replications for 18 different varieties, which resulted in a total of 522 rice plants.

2.7 | Harvest

SES, tiller #, SPAD (chlorophyll reflectance), and PRI (photochemical reflectance index) were measured the day before harvest. To score the leaves, we used a modified standard evaluation score (SES), shown in Table 1.

SPAD and PRI (Shrestha et al., 2012) are non-destructive indicators of plant stress that reflect shifts in photosynthetic capacity. They also reflect the effects of salinity stress, as shown by Asch et al. (2000) regarding SPAD and Wairich et al. (2021) regarding PRI. We measured SPAD using a SPAD 502 (Konica Minolta Holdings K.K., Japan) and PRI with a Plant Pen (Photon Systems Instruments, Czech Republic) on the youngest fully developed leaf on the main tiller. During the harvest of the 7-week-old plants, leaf blades were separated according to leaf level. They were counted starting from the youngest undeveloped leaf and designated as follows: L0 = youngest leaf without a ligule, L1 = leaf 1 or the youngest fully developed leaf blade, L2 = second fully developed leaf blade from the top, L3 = third fully developed leaf blade from the top. The roots and sheaths were washed with deionized water to remove salt crystals or nutrient solution. The separated, bagged and labelled plant organs were dried at 70°C for 48 h. in drying ovens, after which dry biomass was determined.

2.8 | K^+, Na^+ and Cl^- concentration

The analysis of K^+, Na^+ and Cl^- was conducted according to the method of Asch et al. (2022). The dried plant organs were placed in scintillation vials filled with metal balls and ground in a ball mill. Often in the case of smaller organs, such as L0, screw-top vials filled with ceramic balls and a FastPrep-24 (MP Biomedicals, U.S.A.) were used. In larger samples, the ground material was weighed to 0.1 g. Samples were then mixed with 10 mL of deionized water and autoclaved (SanoClav MMCS, Wolf, Germany) at 120°C for an hour. Residue was removed with filter paper and the resulting extract made up to 100 mL with deionized water. K^+ and Na^+ content was determined via a flame photometer (Flame photometer 410-Corning Halstead, UK), whereas Cl^- was determined from the same extract with an autoanalyser (Autoanalyser II, Technicon, U.S.A.).

2.9 | Genotype classification

Genotypes were separated into four groups using hierarchical clustering of the standardized values of the following variables: total

TABLE 1 Modified standard evaluation score (SES) of visual salt injury at seedling stage according to Gregorio et al. (1997).

Modified score	Observation	Tolerance
1	Normal growth, no leaf symptoms	Highly tolerant
3	Nearly normal growth, but leaf tips or few leaves whitish and rolled	Tolerant
5	Growth severely retarded; most leaves rolled; only a few are elongating	Moderately tolerant
7	Complete cessation of growth; most leaves dry some plants dying	Susceptible
9	Almost all plants dead or dying	Highly susceptible

plant biomass (g), total plant NaCl content (mmol), total plant NaCl concentration ($mmol\,g^{-1}$), a weight index (WIndex) and a sensitivity index (SIndex). The WIndex is the ratio of the total plant dry weight of the control to the NaCl treatments, and the SIndex was calculated by dividing the percent reduction in biomass by the NaCl concentration. The NaCl treatments were analysed separately. We assigned two levels of descriptors to the clusters, susceptibility and class. Susceptibility was described as either "tolerant" or "susceptible", and class as either "accumulator" or "avoider". A detailed breakdown of each descriptor is in the following rubric:

1st Level: *Susceptibility*	
Susceptible (S)	High relative reduction in plant biomass
Tolerant (T)	Low relative reduction in plant biomass
2nd Level: *Class*	
Accumulator (Ac)	High relative concentrations of Cl^- and Na^+ at a plant level
Avoider (Av)	Low relative concentrations of Cl^- and Na^+ at a plant level

For example, a variety was considered susceptible (S) or tolerant (T) based on the WI and SI, and then would be classified as an accumulator (Ac) or an avoider (Av) in relation to its relative concentration and content of Na^+ and Cl^- combined. These two classifications were then merged to form four composite groups: S/Ac, T/Ac, S/Av and T/Av.

2.10 | Statistical analysis

We analysed the data using a linear mixed-effects model based on the lme4 package (Bates et al., 2015) in R (R Core Team, 2022). The fixed effects are salinity treatment (0 mM, 50 mM, 100 mM) and variety (1–20), whereas the random effects were the box within the hydroponic system (1–9), and position within each box (1–58). Our data were not heteroscedastic across salinity treatments, which was addressed with a log-transformation. Therefore, the slopes cited are based on regressions of transformed data. The comparison of slopes by organ between varieties was calculated using the emtrends function of the emmeans package (Lenth et al., 2023). To determine differences between varieties and treatments, a Tukey's test was performed. For differences between just 0 mM NaCl and 50 or 100 mM NaCl, respectively, a Dunn–Sidak test was used. The post hoc pairwise comparisons were used to generate marginal means and compact letter displays using the emmeans package (Lenth et al., 2023). All means cited within the text are back-transformed estimated marginal means, and differences between means are estimated contrasts. To separate the varieties by susceptibility and ionic partitioning, we used a combination of hierarchical clustering combined with heatmaps of standardized values of selected variables. Clustering was applied according to Euclidean distance with the ward.D2 method (Kolde, 2019). Parameter values were standardized by taking the marginal means and dividing by the standard deviation across all varieties within each NaCl treatment. The Principle Component Analyses (PCA) and its biplots were created using R packages, Factoextra (Kassambara & Mundt, 2020) and FactoMineR (Le et al., 2008).

3 | RESULTS

Genotypic differences in response to the NaCl treatments were observed in terms of biomass and ion (Na^+, K^+ and Cl^-) content. This allowed us to classify varieties using hierarchical clustering in terms of their susceptibility and partitioning of Na^+ and Cl^-. The resulting groups were then further characterized by exploring their association with other measured parameters via PCA biplots.

3.1 | Biomass

Compared to the control (0 mM NaCl), total plant biomass averaged across varieties was significantly reduced, by 39% and 52% at 50 and 100 mM NaCl respectively. The effects of the salinity treatments, variety and its interaction with each NaCl treatment on plant and individual organ (L0, L1, L2, L3, sheaths, roots, dead leaves) biomass were highly significant ($p < 0.0001$). Biomass reduction compared to the control at 50 mM NaCl, ranged from 26% (OM4218) to 51% (Loc Troi 5), and 21% (BTE1) to 70% (Jasmine 85) at 100 mM NaCl. Varietal differences by NaCl treatment are shown in Appendix 2 (biomass) and Appendix 3 (percentage of control) and Figure 1. Averaged over all varieties, the organ with the greatest relative decrease between control and either 50 mM or 100 mM NaCl treatments was L0, with a 65% reduction in biomass under 50 mM, which was identical to its reduction under 100 mM NaCl (Appendix 3). Relative to other organs, L3 suffered the smallest reduction in biomass, 22% and 29% under 50 mM and 100 mM NaCl respectively.

The decrease in biomass as NaCl concentration increased is clearly shown in Figure 2a. This was most severe in the youngest leaf blades, in particular L0, and the roots. Older leaf blades, L2 and L3, were less susceptible to NaCl concentration. Regression slopes by variety and organ are reported in Appendix 4. As shown in Figure 2b, the slopes of each organ's biomass to NaCl concentration were mostly highly positively correlated. The exceptions were L3 and L0, which were significantly negatively correlated, with a correlation coefficient of −0.56.

3.2 | Ion content (K^+, Na^+, Cl^-)

As shown in Table 2, plant Na^+ and Cl^- content (mmoL) and concentration ($mmoL\,g^{-1}$) significantly increased with NaCl concentration ($p < .0001$). This was also true for plant K^+ concentration ($p < .001$), but K^+ content significantly decreased with NaCl concentration ($p < .001$). Across varieties, the increase in Na^+ content with NaCl concentration mirrored that of Cl^-, which is reflected by their

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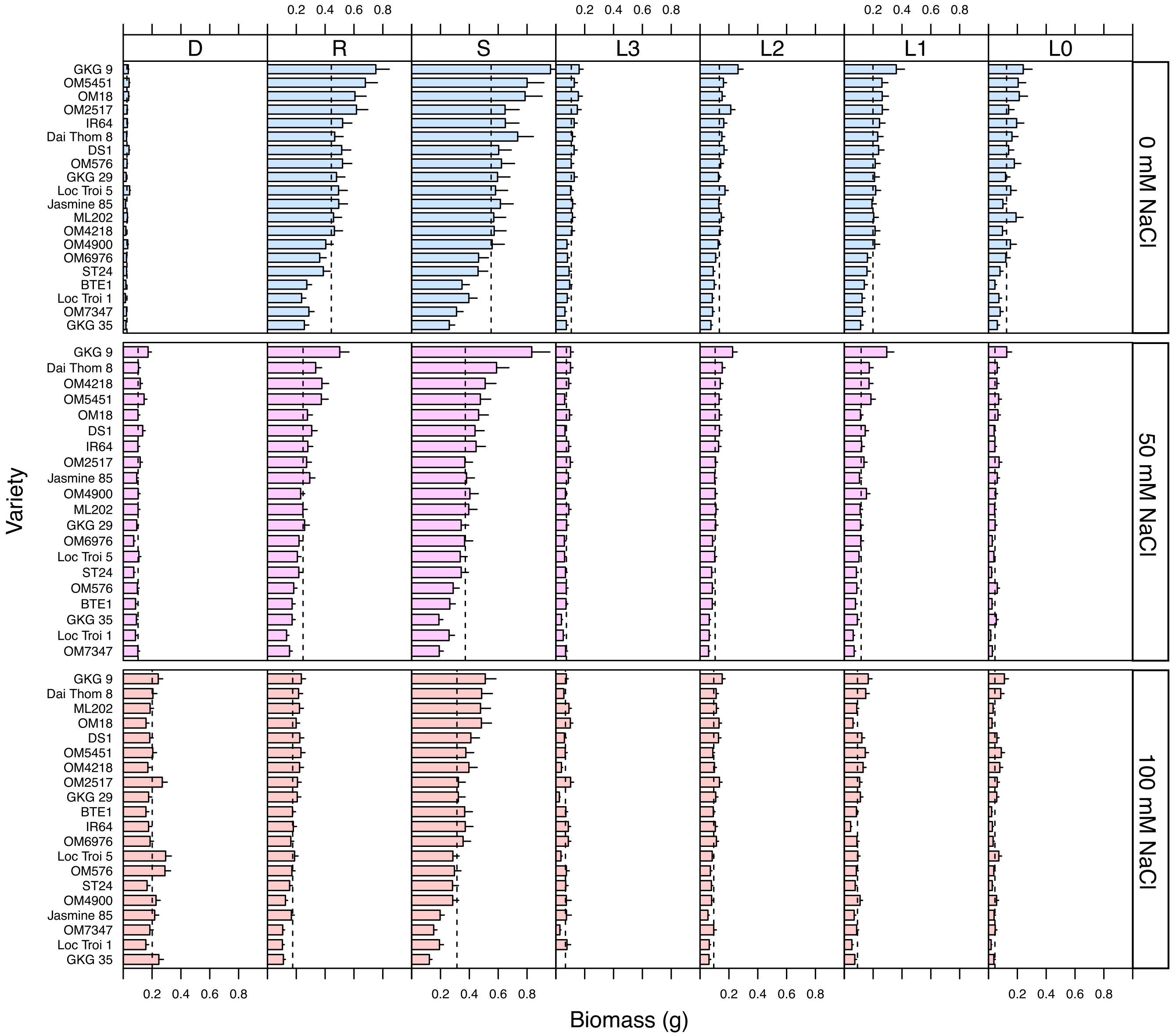

FIGURE 1 Mean dry weight (g) and standard error of each measured organ by variety and treatment. The bars of each organ and variety are arranged in descending order by total living biomass within each treatment. The dotted line refers to the mean biomass of the corresponding organ averaged over variety. L0 = youngest leaf without a ligule, L1 = the youngest fully developed leaf blade, L2 = second fully developed leaf blade from the top, L3 = third fully developed leaf blade from the top, S = sheaths, R = roots, D = dead leaves.

correlation coefficient, 0.97. However, the correlation coefficients of Cl^- to K^+ and Na^+ and K^+ content were 0.62 and 0.55 respectively. There was a greater accumulation of plant Cl^- compared to Na^+ across all treatments. Cl^- was higher than Na^+ by 268% in the control, 132% at 50 mM NaCl, and 137% at 100 mM NaCl. Relative to the control, K^+ content decreased by 18% under 50 and 100 mM NaCl. The sheaths and roots accumulated most of the Cl^-, K^+ and Na^+ content. However, at 50 mM and 100 mM NaCl, Na^+ and Cl^- were mostly concentrated in dead leaves (Table 2). The lowest concentrations of Na^+ and Cl^- were in the leaf blades, decreasing inverse to leaf age. In contrast, the highest concentration of K^+ was in the leaf blades under 100 mM NaCl, and under both 50 mM NaCl and 100 mM NaCl it decreased with leaf age. Differences in ion accumulation between varieties and how it shifted corresponding to the NaCl treatments was highly significant for K^+, Na^+ and Cl^- ($p < .0001$).

Where ions are partitioned within the plant is as important as their overall accumulation in the plant. Accordingly, ion partitioning by organ is shown in Figure 3. As NaCl concentration increased, a greater percentage of Na^+ and Cl^-, around 27% under 100 mM NaCl, were sequestered in dead leaves. Across all NaCl treatments, the sheaths accumulated the greatest proportion of ions within the plant, 24% of Na^+, 28% of Cl^-, and 36% of K^+. Although K^+ content decreased with the NaCl treatments (Table 2) and a greater share was trapped in dead leaves, its presence was maintained in the leaf blades.

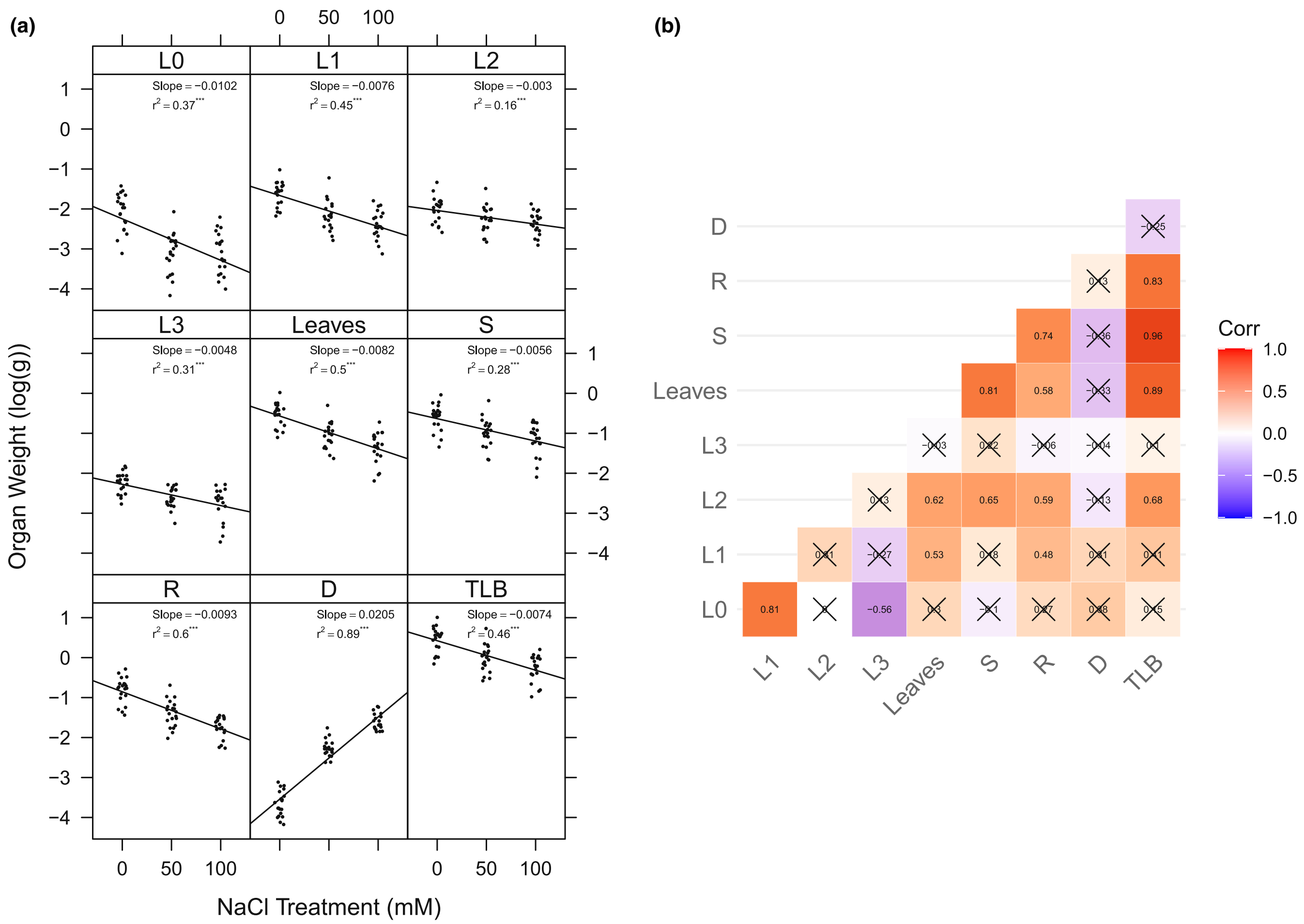

FIGURE 2 (a) Log-transformed organ dry weights (g) averaged over all varieties was plotted against root zone NaCl concentrations (*M*). A linear regression was performed on each organ, and the corresponding slope shown. L0 = youngest leaf without a ligule, L1 = the youngest fully developed leaf blade, L2 = second fully developed leaf blade from the top, L3 = third fully developed leaf blade from the top, Leaves = combined biomass of L1, L2 and L3, S = sheaths, R = roots, Dead = dead leaves, and TLB, total living biomass. (b) The slopes of each organ were correlated with each other, with Pearson's correlation coefficient shown. Correlations with a $p > 0.05$ were crossed out.

The relationship between the two cations, K^+ and Na^+, is reflected by the K/Na ratio (Figure 4). The plant K/Na ratio decreased with the severity of the NaCl treatment, from 3.67 ± 0.06 mmol mmolL^{-1} at 0 mM NaCl, to 0.49 ± 0.06 mmol mmolL^{-1} under 100 mM NaCl. The K/Na ratio was highest in the leaf blades, followed by the sheaths, roots and dead leaves. Under both salinity treatments, the K/Na ratio significantly decreased with leaf age.

3.3 | Genotype classification

Biomass was combined with plant ion uptake to separate genotypic performance under 50 mM NaCl and 100 mM NaCl via hierarchical clustering, shown in Figure 5. Based on clustering and standardized values, we classified varieties by their susceptibility: susceptible (S) or tolerant (T), and class: accumulator (Ac) or avoider (Av). Susceptibility was consistent between 50 and 100 mM NaCl treatments, with only a few varieties (GKG9, OM4900 and OM5451) considered 'tolerant' under 50 mM NaCl, but then 'susceptible' under 100 mM NaCl. The class of BTE 1, OM6976, DS1, OM5451, ML202 and ST24 was 'accumulator' under 50 mM NaCl, but 'avoider' under 100 mM. 'Avoiders' at 50 mM NaCl rarely became 'accumulators' at 100 mM NaCl, with only Jasmine 85 and OM2517 changing from 'avoiders' to 'accumulators'.

3.3.1 | Group characteristics

Susceptibility and class were combined to create groups (S/Av, T/Av, S/Ac, T/Ac). Ion (Cl^-, Na^+ and K^+) partitioning and how it differs by group is shown in PCA biplots for each NaCl treatment. In Figure 6a, PC1 explains 33.8%, and PC2, 20.3% of the variance. There is a high degree of overlap between groups, and the scale is smaller than in Figure 6b, making differences between groups less distinct. According to both figures, ion (Cl^-, Na^+, and K^+) content was highly correlated to the organ in which it was stored within the plant. Differences in groups was due to overall ion partitioning. Varieties in group T/Av, such as OM4218, partitioned ions in the sheaths and roots, whereas varieties in group S/Ac, such as OM576 and Loc Troi 5, had greater

TABLE 2 Mean ion (Cl^-, K^+, Na^+) content and concentration by organ and NaCl treatment (0, 50, 100 mM NaCl).

		Content (mmol)			Concentration (mmol g^{-1})		
Ion	Organ	0	50	100	0	50	100
Cl^-	L0	0.038 ± 0.003^a	0.022 ± 0.002^b	0.038 ± 0.003^c	0.30 ± 0.01^a	0.50 ± 0.02^b	0.83 ± 0.04^c
	L1	0.073 ± 0.004^a	0.079 ± 0.005^{ab}	0.099 ± 0.006^b	0.37 ± 0.03^a	0.68 ± 0.05^b	1.10 ± 0.08^c
	L2	0.048 ± 0.003^a	0.096 ± 0.006^b	0.121 ± 0.008^b	0.36 ± 0.01^a	0.93 ± 0.04^b	1.22 ± 0.05^c
	L3	0.038 ± 0.002^a	0.081 ± 0.005^b	0.096 ± 0.007^b	0.36 ± 0.02^a	1.10 ± 0.05^b	1.44 ± 0.08^c
	S	0.260 ± 0.018^a	0.427 ± 0.029^b	0.466 ± 0.032^b	0.47 ± 0.02^a	1.16 ± 0.04^b	1.49 ± 0.05^c
	R	0.204 ± 0.015^b	0.171 ± 0.013^b	0.127 ± 0.010^a	0.46 ± 0.01^a	0.70 ± 0.02^b	0.73 ± 0.02^b
	D	0.028 ± 0.001^a	0.308 ± 0.012^b	0.520 ± 0.031^c	1.00 ± 0.04^a	3.02 ± 0.11^b	2.82 ± 0.10^b
	P	0.752 ± 0.025^a	1.596 ± 0.052^b	2.206 ± 0.072^c	0.47 ± 0.02^a	1.47 ± 0.07^b	2.22 ± 0.11^c
K^+	L0	0.069 ± 0.007^b	0.034 ± 0.003^a	0.034 ± 0.004^a	0.56 ± 0.01^a	0.76 ± 0.02^b	0.76 ± 0.02^b
	L1	0.109 ± 0.009^b	0.089 ± 0.008^{ab}	0.074 ± 0.006^a	0.55 ± 0.01^a	0.77 ± 0.02^b	0.82 ± 0.02^b
	L2	0.073 ± 0.005^a	0.067 ± 0.005^a	0.069 ± 0.005^a	0.55 ± 0.03^a	0.64 ± 0.03^{ab}	0.70 ± 0.04^b
	L3	0.051 ± 0.004^a	0.043 ± 0.004^a	0.038 ± 0.003^a	0.48 ± 0.02^a	0.59 ± 0.03^b	0.56 ± 0.03^{ab}
	S	0.460 ± 0.049^c	0.282 ± 0.030^b	0.173 ± 0.018^a	0.83 ± 0.04^b	0.76 ± 0.04^b	0.55 ± 0.03^a
	R	0.161 ± 0.012^b	0.130 ± 0.010^b	0.060 ± 0.005^a	0.37 ± 0.01^a	0.53 ± 0.01^b	0.35 ± 0.01^a
	D	0.006 ± 0.001^a	0.055 ± 0.004^b	0.114 ± 0.009^c	0.21 ± 0.01^a	0.54 ± 0.02^b	0.62 ± 0.03^b
	P	0.962 ± 0.054^a	0.791 ± 0.044^b	0.745 ± 0.042^b	0.60 ± 0.02^a	0.73 ± 0.02^b	0.75 ± 0.02^b
Na^+	L0	0.004 ± 0.001^a	0.008 ± 0.001^b	0.018 ± 0.002^c	0.04 ± 0.00^a	0.19 ± 0.02^b	0.39 ± 0.05^c
	L1	0.006 ± 0.001^a	0.028 ± 0.002^b	0.044 ± 0.003^c	0.03 ± 0.01^a	0.24 ± 0.03^b	0.48 ± 0.05^c
	L2	0.005 ± 0.001^a	0.041 ± 0.004^b	0.055 ± 0.006^b	0.03 ± 0.01^a	0.40 ± 0.03^b	0.56 ± 0.05^b
	L3	0.005 ± 0.001^a	0.038 ± 0.003^b	0.055 ± 0.005^c	0.05 ± 0.01^a	0.52 ± 0.04^b	0.81 ± 0.07^c
	S	0.057 ± 0.004^a	0.321 ± 0.022^b	0.383 ± 0.026^b	0.10 ± 0.01^a	0.87 ± 0.04^b	1.22 ± 0.05^c
	R	0.165 ± 0.011^a	0.176 ± 0.012^a	0.152 ± 0.010^a	0.37 ± 0.01^a	0.72 ± 0.01^b	0.87 ± 0.02^c
	D	0.010 ± 0.001^a	0.242 ± 0.015^b	0.387 ± 0.024^c	0.37 ± 0.01^a	2.37 ± 0.09^b	2.10 ± 0.07^b
	P	0.280 ± 0.012^a	1.16 ± 0.049^b	1.67 ± 0.070^c	0.17 ± 0.001^a	1.07 ± 0.06^b	1.68 ± 0.09^c

Note: L0 = youngest leaf without a ligule, L1 = the youngest fully developed leaf blade, L2 = second fully developed leaf blade from the top, L3 = third fully developed leaf blade from the top, S = sheaths, R = roots, D = dead leaves, P = entire plant. 0, 50, 100 refer to the concentrations (mM) of the NaCl treatments. "±" indicates standard error. Marginal means by ion and organ not sharing any letter are significantly different by Tukey's test at the 5% level.

ion partitioning in L0. The group T/Ac was more diffuse, although its centroid indicates ion partitioning in L3 and in dead leaves, whereas the group S/Av in the form of IR64 and OM18 had greater ion partitioning in L1 and L2. In Figure 6b, PC1 explains 36.6%, and PC2, 27.9% of the variance. There is greater separation between classes, with groups T/Av and S/Av both maintaining a greater proportion of ions in L3, the sheaths, and the roots. In contrast, the groups T/Ac and S/Ac partitioned Cl^-, Na^+, and K^+- in dead leaves.

The correlation between ion (Cl^-, Na^+, K^+) concentration and other indicators, such as K/Na ratio by organ (leaf blades, sheaths, dead leaves and roots), SPAD, PRI, tiller #, total biomass and the percentage of biomass compared to the control are shown separately for 50 mM NaCl and 100 mM NaCl salinity treatments. In Figure 7a, PC1 explains 26.7%, and PC2, 22.7% of the variance. At 50 mM NaCl, SPAD values were inversely related to the total leaf blade Cl^- concentration and Na^+ concentration in the sheaths. SPAD values were also strongly linked with the group T/Av. However, the leaf and sheath K/Na ratio and tiller # were linked with the group S/Av. In Figure 7b, PC1 explains 35.7%, and PC2, 21.3% of the variance. High SPAD and PRI values as well as root K^+ and Cl^- concentrations at 100 mM NaCl were associated with the group T/Av and directly inverse to the combined leaf and sheath Cl^- and Na^+ concentrations which were associated with the groups S/Ac and T/Ac. The difference in biomass relative to the control was correlated with the Cl^- and Na^+ concentrations in the dead leaves.

4 | DISCUSSION

4.1 | Effect of salinity on biomass

Salinity significantly reduced biomass in all varieties ($p < .0001$). This was most apparent in the leaves but varied by leaf level. The biomass of L0 decreased severely at 50 mM NaCl, whereas biomass accumulation of L2 and L3 was the least sensitive to NaCl concentration

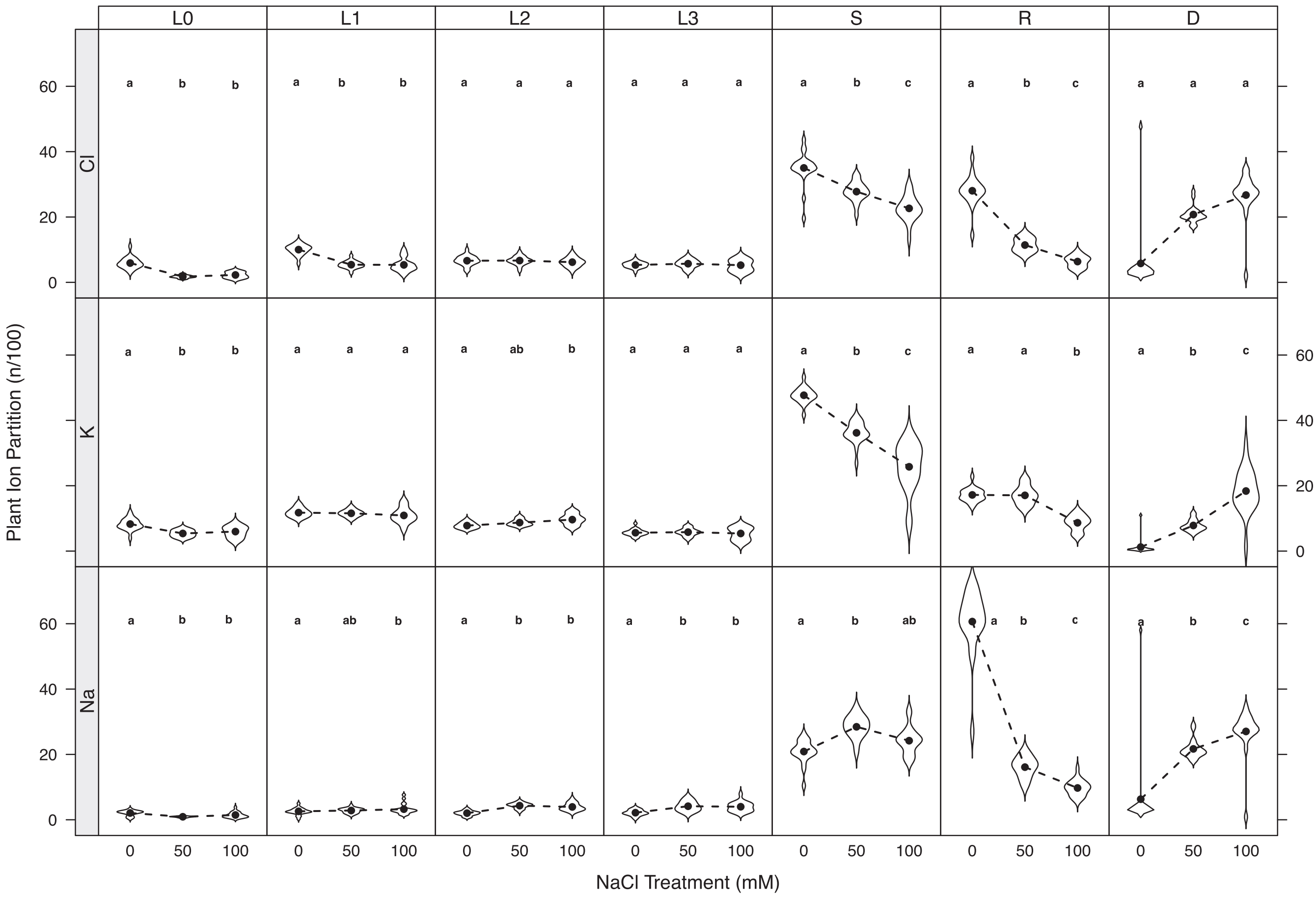

FIGURE 3 Violin plots showing varietal distribution of the mean percent of the total plant ion content (Na^{+}, K^{+} and Cl^{-}) by organ and NaCl treatment. The dotted line connects the corresponding ion partition organ means averaged over variety, indicated as •. Marginal means across treatment and organ not sharing any letter are significantly different by Tukey's test at the 5% level of significance. L0 = youngest leaf without a ligule, L1 = the youngest fully developed leaf blade, L2 = second fully developed leaf blade from the top, L3 = third fully developed leaf blade from the top, S = sheaths, R = roots, D = dead leaves, P = total plant biomass. 0, 50, and 100 refer to the NaCl treatment (mM).

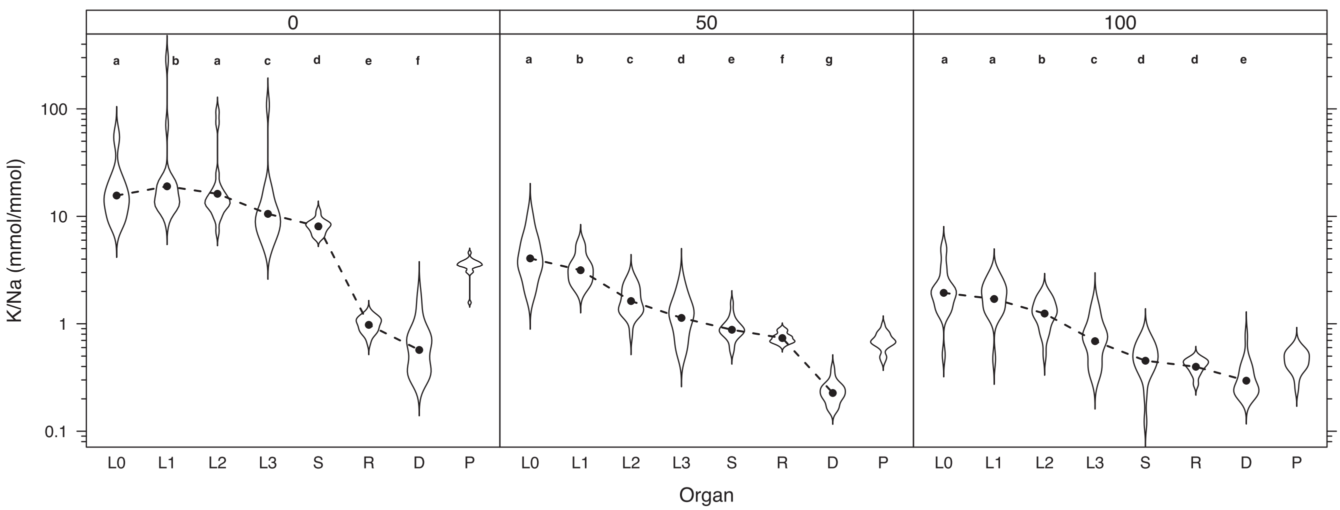

FIGURE 4 Violin plots showing varietal distribution of K/Na ratio by organ within each NaCl treatment. The x-axis uses a logarithmic scale (base 10). The dotted line connects the corresponding K/Na organ means averaged over variety, indicated as •. Means across treatment and organ not sharing any letter are significantly different by Tukey's test at the 5% level of significance. L0 = youngest leaf without a ligule, L1 = the youngest fully developed leaf blade, L2 = second fully developed leaf blade from the top, L3 = third fully developed leaf blade from the top, S = sheaths, R = roots, D = dead leaves, P = total plant biomass. 0, 50, and 100 refer to the NaCl treatment (mM).

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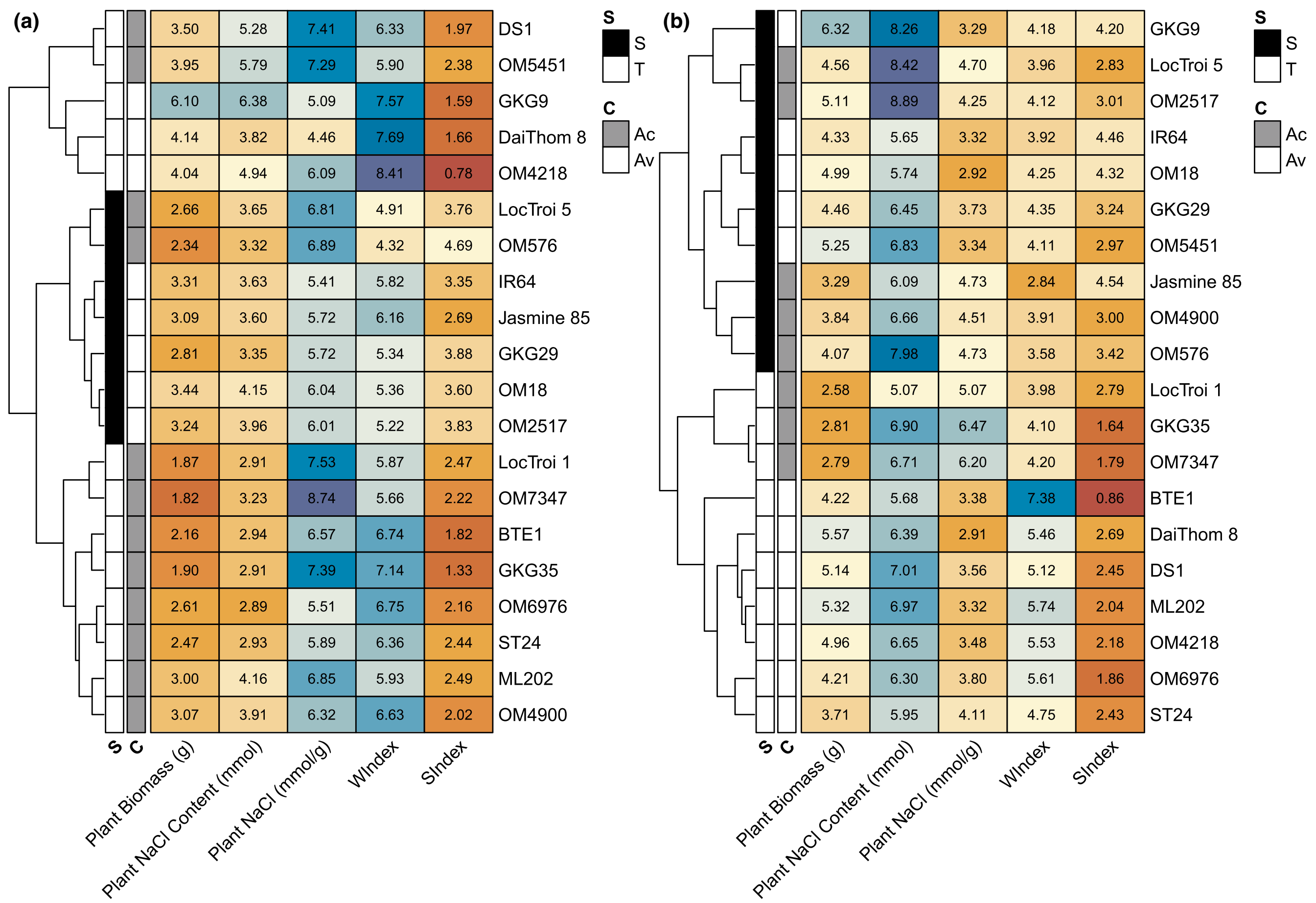

FIGURE 5 Heatmaps of standardized values of parameters: plant biomass (g), plant NaCl content (mmoL), plant NaCl concentration (mmoL g^{-1}) and two indices: a weight index (WIndex), the ratio of biomass under 0 mM NaCl to biomass under 50 or 100 mM NaCl (g g^{-1}), and finally a sensitivity index (SIndex), the percent reduction in biomass between NaCl treatments divided by the NaCl concentration within the plant under (a) 50 mM NaCl and (b) 100 mM NaCl. Varieties were subsequently clustered using hierarchal clustering and according to the values of the parameters assigned a susceptibility level (S): susceptible (S) or tolerant (T) and a class (T): accumulator (Ac) or avoider (Av).

(Figure 2a, Table 2, and Appendix 3). In Figure 2b, the slope of L0 was negatively correlated with that of L3. This suggests that the generation of new leaves was linked to greater L3 senescence. The roots also suffered a large reduction in biomass under the NaCl treatments (Figure 2a, Appendices 2 and 3). The decrease in root to shoot ratio, and yet lower relative Cl^- and Na^+ content compared to the sheaths (Table 2), indicates the stress is osmotic rather than ionic. This is due to the direct contact of the roots to the NaCl solution. The sheaths suffered the smallest reduction in biomass even with the highest concentrations of Cl^- and Na^+ compared to other organs. Neang et al. (2019) found that transporters remove excess Cl^- and Na^+ ions from the xylem stream and compartmentalize them in sheath parenchyma cells. Sheath sequestration of Na^+ has also been observed in wheat (Davenport et al., 2005) and sorghum (Netondo et al., 2004).

4.2 | Ion concentration and distribution

As shown in Table 2, plant uptake of both Na^+ and Cl^- increased along with NaCl concentration. Na^+ and Cl^- were primarily partitioned in lower leaf levels (L2 and L3), sheaths and dead material. This follows the studies of Yeo and Flowers (1986) and Asch et al. (1997) in regard to Na^+ and Neang et al. (2019) in regard to Cl^-. The partitioning of Na^+ and Cl^- in older leaves is due to their greater vacuolar capacity compared to younger leaves (Wang et al., 2012). The reduction in younger leaf biomass despite limited accumulation of Na^+ and Cl^- is likely linked to reduced leaf expansion related to osmotic stress (Horie et al., 2012). Total plant K^+ concentration increased with NaCl concentration, but total plant K^+ content decreased. K^+ concentration of the leaf blades was maintained under salinity despite lower plant K^+ content by drawing K^+ from the sheaths (Table 2). The counterintuitive increase in K^+ concentration but decrease in content particularly in the leaf blades, nicely shown in Table 2, can be explained by leaf blade biomass itself decreasing (Figure 1 and Figure 2a). The location and concentration of K^+ has been shown to have a beneficial role in the plant management of salinity stress (Bohra & Doerffling, 1993). In our study, neither total plant nor K^+ status of individual organs predicted plant performance under salinity, which was similar to the results of Coskun et al. (2013). In fact, Pires et al. (2015) suggested K/Na ratio is mostly a reflection of Na^+ content. This was supported by

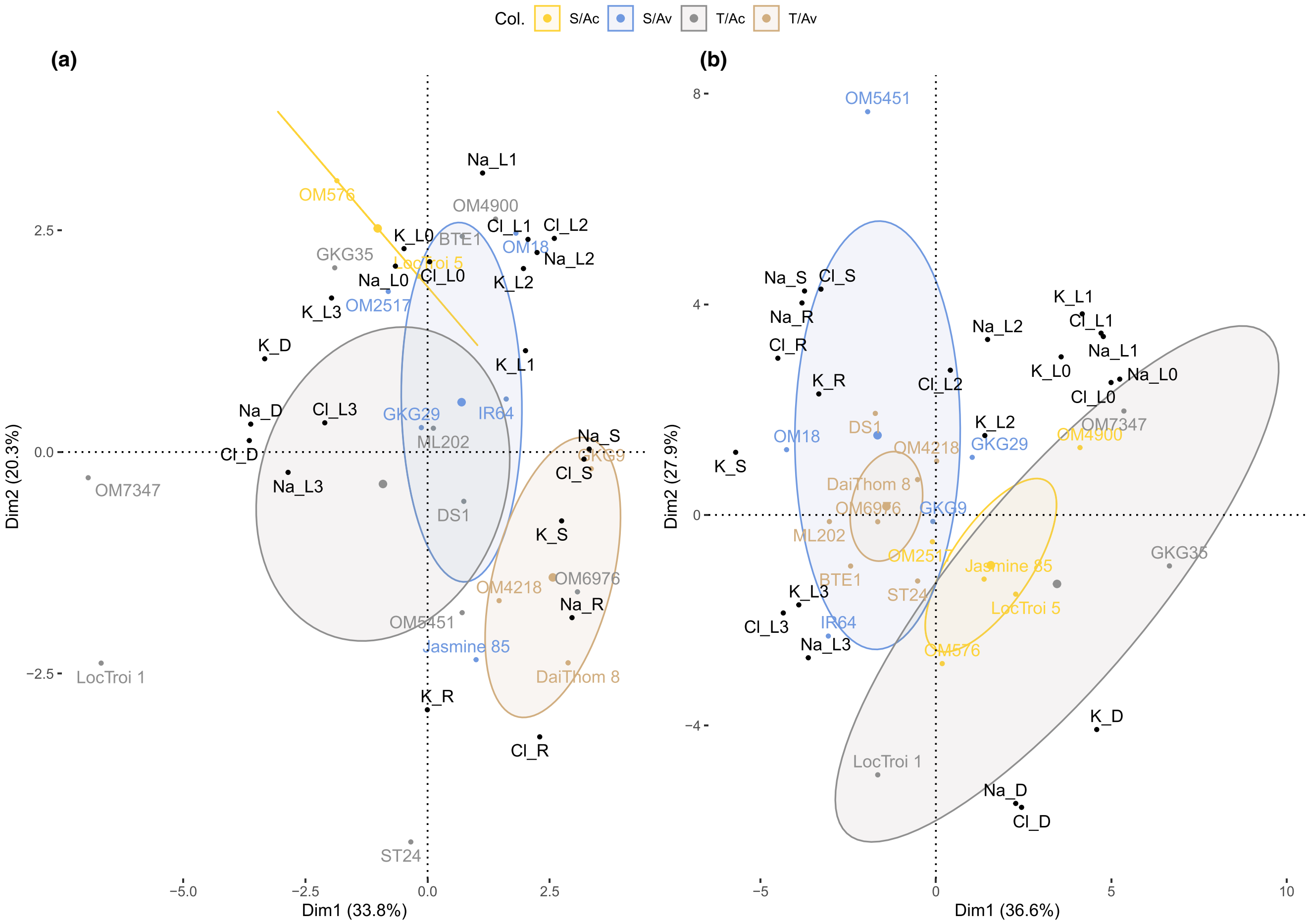

FIGURE 6 PCA biplot of the partitioning of ions (Na^+, K^+ and Cl^-) under (a) 50 mM NaCl and (b) 100 mM NaCl. The 95% confidence ellipsoids with corresponding centroids represent groups (T/Ac, S/Ac, T/Av, S/Ac) by colour. Partitions are referred to by organ L0 = youngest leaf without a ligule, L1 = the youngest fully developed leaf blade, L2 = second fully developed leaf blade from the top, L3 = third fully developed leaf blade from the top, S = sheaths, R = roots, followed by the ion: Na^+, K^+ or Cl^-.

the PCA-biplots in Figure 7, in which K^+ concentration was not correlated with biomass loss. Consequently, instead of just considering ion content, the activity of known K^+, Na^+ and Cl^- transporters in rice should be considered (Horie et al., 2012).

4.3 | Screening for strategy

Several approaches were used in this study, from simple to complex, to differentiate genotypic performance under salinity. Slope analysis of biomass to NaCl concentration showed the overall trend of the reduction in biomass as salinity increased but not significant differences between varieties (Appendix 5). However, the significant interaction between genotype and NaCl treatment implies genotypic thresholds at which NaCl concentration begins to significantly impair plant growth. A greater number of NaCl treatments are needed for threshold analysis, such as that performed in rice by Radanielson et al. (2018) or in sweet potato by Mondal et al. (2022). This would be difficult to scale beyond more than a handful of genotypes without the use of a high through-put phenotyping.

SES incorporates several parameters by relying on visual symptoms (Table 1). The SES value approximates salinity stress according to ion accumulation (i.e. white tips on the leaves and leaf senescence), osmotic stress (i.e. leaf rolling) and biomass reduction (i.e. stunting). Although it indicated differences in susceptibility at 100 mM NaCl, it was unable to show genotypic differences at 50 mM NaCl (Appendix 6).

Multivariate analysis, such as hierarchical clustering, is a flexible approach that can incorporate multiple parameters to differentiate genotypic performance. It is particularly well-suited for the complexity of a multi-trait characteristic such as salinity tolerance (Yeo et al., 1990). For example, in the study of Zeng et al. (2002), agronomic parameters in salt-stressed plants were used to cluster and then rank varietal tolerance to salinity. Similarly, Tin et al. (2021) used hierarchical clustering to determine tolerance of promising lines according to SES and biomass. In our study, we considered morphology and ion content, which were further refined with indices, to not only identify better performing varieties but their strategies towards partitioning ions. Under 50 or 100 mM NaCl treatments, the best performing varieties in terms

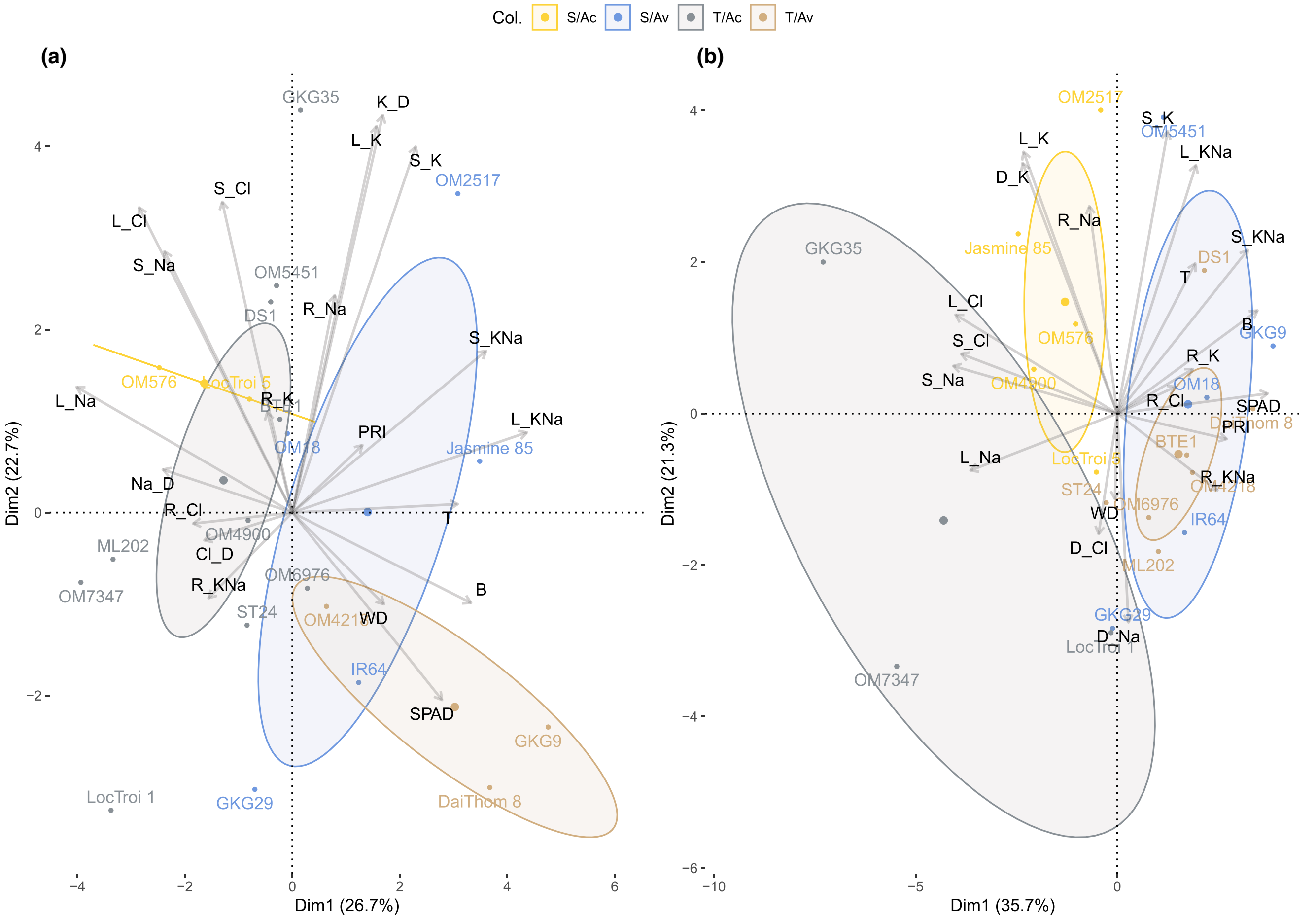

FIGURE 7 PCA biplot of the relationships under (a) 50 mM NaCl and (b) 100 mM NaCl of selected parameters: tiller # (T), percent of weight either under 50 or 100 mM NaCl to 0 mM Nacl (WD), total plant biomass (B), PRI, SPAD, the concentration of Na^+, K^+ and Cl^- and K/Na ratio in the leaf blades (L), sheaths (S) and roots (R). The 95% confidence ellipsoids with corresponding centroids represent groups (T/Ac, S/Ac, T/Av, S/Ac) by colour.

of biomass reduction (WIndex), were those that maintained low Na^+ and Cl^- concentrations, such as Dai Thom 8, and indicated tissue tolerance (SIndex) to Na^+ and Cl^-, such as BTE 1. Relatively higher plant concentrations of Na^+ and Cl^- under 50 mM were not heavily penalized in terms of biomass, which was also reflected in the homogeneity of SES. This suggests that stress severity at 50 mM NaCl for 2 weeks was mostly tolerable. Low concentrations of salinity can even promote growth, as observed by Radanielson et al. (2018). Reducing the intake of Na^+ and Cl^-, or avoidance, could either mean lower Na^+ and Cl^- uptake, which was more prevalent under 100 mM NaCl, as shown by BTE1, or higher levels of Na^+ and Cl^- uptake matched by increased vigour. This is avoidance by other means, or dilution via biomass (Yeo et al., 1990), which was observed in tolerant avoiders under 50 mM NaCl, such as GKG 9.

Susceptibility was consistent across NaCl treatments, with only three varieties shifting from tolerant to susceptible. In contrast, several varieties changed class, mostly from accumulators to avoiders as NaCl concentration increased, but only two varieties considered avoiders at 50 mM NaCl were accumulators at 100 mM NaCl. This suggests that susceptibility determined at lower NaCl concentrations is generally predictive of susceptibility at higher NaCl concentrations. This was only true in regard to class for varieties considered as avoiders. Varieties that went from accumulators to avoiders at higher NaCl concentrations indicates that ion accumulation under 50 mM NaCl was less problematic and as a result there was less need to adjust Na^+ and Cl^- uptake.

4.4 | Group ion partitioning and indicators

Control of ion partitioning within the plant is as important as control of ion uptake. Under 50 mM NaCl, tolerant avoiders and accumulators partitioned ions in the older leaf blades, sheaths and roots (Figure 6a). Under 100 mM, the separation was according to susceptibility rather than tolerance (Figure 6b). Avoiders partitioned ions in older leaf blades, sheaths and roots, whereas accumulators partitioned ions in dead leaves.

SPAD and PRI, both measured in this experiment on L1, were strongly negatively correlated with Na^+ and Cl^- concentrations

(Figure 7). SPAD is a measure of greenness, which reflects chlorophyll content, and in turn correlates to photosynthetic rate (Ma et al., 1995). The accumulation of Na^+ and Cl^- in the leaves impairs photosynthesis (Yeo et al., 1985), and leads to changes in leaf pigment composition (Munns & Tester, 2008), and therefore is an effective indicator of salinity tolerance (Asch et al., 2000). In our study, under both NaCl treatments, SPAD (Appendix 6) was most negatively correlated to Cl^- concentration and closely associated with tolerant avoiders. PRI also indicates photosynthetic stress, particularly in response to Cl^- content in the leaf (Sukhova et al., 2023). The determination of ion content is destructive and time consuming. Instead, as Figure 7 shows, SPAD and PRI, which are nondestructive and easily as well as rapidly measured could be used as both effective indicators of plant Na^+ and Cl^- accumulation and salinity susceptibility.

4.5 | Varieties for saline conditions in the VMD

Of the varieties tested, the most resilient variety in the face of salinity stress was the hybrid variety BTE 1. According to the yield data from a related two-year field experiment with the same varieties (Appendix 1), GKG 35 is the highest yielding and, according to our analysis, relatively tolerant (Figure 5). Our study measures the effect of salinity on plant performance during the vegetative stage of the selected varieties, similar to Asch et al. (2000). Although as a result, observed genotypic performance may not extend to seedling or reproductive stages (Lutts et al., 1995). A following field experiment is needed to determine the effect during reproductive stages and could also include a measurement of recovery after stress as salinity in the field is often a periodic not continuous stress. Multivariate analysis can accommodate, if not benefit from more parameters related to the plant response to salinity, such as yield components, or biochemical processes, such as ROS scavenging (Wairich et al., 2021), osmolyte production or even expression levels of ion transporters (Negrão et al., 2011).

5 | CONCLUSION

The best strategy towards salinity stress is to prevent Cl^- and Na^+ from accumulating in the rice plant. At lower NaCl concentrations this is achieved through vigour (GKG9), but as NaCl levels increase, the plant must actively prevent Cl^- and Na^+ accumulation. With this study we were able to identify differences in tolerance to salinity within varieties commonly grown in the VMD, but also gain insight into the underlying uptake and partitioning strategies for Cl^- and Na^+. The combination of evaluating the general effect of salinity on the plant and its respective ion uptake and partitioning strategy could serve as an effective and efficient phenotyping tool to identify salinity-tolerant genotypes as well as genetic traits contributing to salinity tolerance. This is useful to farmers, especially those currently cultivating land at higher risk of salinization due to flooding or contaminated groundwater, and serves as a basis for further breeding efforts to improve the performance of varieties in the VMD prized for their yield, robustness, and quality. However, the determination of susceptibility to salinity should not only be based on biomass during a rice plant's most resistant life stage, but also its most sensitive, such as the reproductive stage. Field experiments with the same varieties are needed to measure the effect of salinity on yield-forming processes and yield.

AUTHOR CONTRIBUTIONS

Kristian Johnson: Writing – original draft; investigation; methodology; visualization; writing – review and editing; formal analysis; software; data curation. **Duy Hoang Vu:** Writing – review and editing; investigation; methodology. **Folkard Asch:** Conceptualization; writing – review and editing; supervision.

ACKNOWLEDGEMENTS

The authors thank the Anton & Petra Ehrmann-Stiftung, and most importantly the Federal Ministry of Education and Research (BMBF) and the Project Management Organization Jülich for funding and supporting the research project RiSaWa, "Rice Production Caught Between Salinity and Drought – Future Options for Sustainable Use of Water in the Mekong Delta Region" (grant agreement No.031B0724). A special thanks for their time and help to Julia Asch, Tabea Mengen, Linda Groot Nibbelink, Sonja Wild, and for his excellent and patient tutelage of statistics, Dr. Jens Hartung. Open Access funding enabled and organized by Projekt DEAL.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

ORCID

Kristian Johnson https://orcid.org/0000-0002-7950-7212
Duy Hoang Vu https://orcid.org/0000-0002-2196-5819
Folkard Asch https://orcid.org/0000-0001-6589-9916

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How to cite this article: Johnson, K., Vu, D. H., & Asch, F. (2024). Traits contributing to salinity tolerance in rice genotypes from the Mekong Delta. *Journal of Agronomy and Crop Science*, *210*, e12679. https://doi.org/10.1111/jac.12679

APPENDIX 1

A description of rice varieties used in the greenhouse experiment.

Variety	Parents	Year of release	Known abiotic resistance	Yield potential (*t*/ha)	Measured yield (*t*/ha)
BTE1	Three-line hybrid	2008	Acid sulphate soil tolerance and salinity tolerance: 3%–4%	9–10	7.0
Đài Thơm 8	BVN/OM4900	2017		7–8	6.9
ĐS1	Unknown	2010 (North Vn); 2019 (South Vn)		8–9	7.2
GKG29	OM6976/Hoa Lài	Not yet		7–8	6.9
GKG35	OM2517/OM5954	Not yet	Acid sulphate soil and salinity tolerance	7–8	7.3
GKG9	OM5472/Thai Long Grain	2016	Acid sulphate soil tolerance and salinity tolerance: 3%–4%	7–8	6.7
IR64	IR5657-33/IR2061-465	1986		7–8	6.4
Jasmine 85	Peta/TN1/KDML	1993		7–8	6.3
Lộc Trời 1	IR64/Basmati 370	2016		6–7	7.0
Lộc Trời 5	OM6976/OM5451	2018		7–8	6.8
ML202	IR50404/Anao/IR8423/LĐ72	2013		7–8	7.3
OM18	OM8017/OM5166	2019	Salinity resistance: 3%–4%	7–8	6.5
OM2517	OM1325/OMCS94	2004	Salinity resistance: 3%–4%	7–8	5.3
OM4218	OM2031/MTL250	2010	Acid sulphate soil tolerance	7–8	6.2
OM4900	C53/Jasmine 85	2008	Salinity resistance: 2%–3%	7–8	6.6
OM5451	Jasmine 85/OM2490	2011	Salinity resistance: 3%–4%	7–8	6.6
OM576	IR48/Hungary	1991	Salinity resistance: 3%–4%	8–9	6.9
OM6976	IR68144/OM997/OM2718/OM2868	2011	Slight acid sulphate soil and salt resistance	7–8	6.6
OM7347	Khao Daw Mali 105/BL/BL	2011		7–8	6.9
ST24	HC/ST3ĐB/TTĐB/R15/ST20	2019		5–6	5.6

Note: Based on private correspondence with rice breeders at Loc Troi and Cuu Long Delta Rice Research Institute. Measured yield was from a two-year field experiment during in the VMD reported by Johnson et al. (2023).

APPENDIX 2

Mean organ weight (g) and tillers (#) by NaCl treatment (0, 50, 100 mM NaCl).

Treatment	Variety	L0	L1	L2	L3	S	R	D	T
0	BTE1	0.04 ± 0.01	0.14 ± 0.02	0.10 ± 0.01	0.10 ± 0.02	0.35 ± 0.05	0.27 ± 0.03	0.02 ± 0.00	2.2 ± 0.3
	Dai Thom 8	0.16 ± 0.04	0.23 ± 0.04	0.15 ± 0.02	0.11 ± 0.02	0.74 ± 0.11	0.47 ± 0.06	0.02 ± 0.00	3.7 ± 0.4
	DS1	0.14 ± 0.04	0.24 ± 0.04	0.17 ± 0.02	0.13 ± 0.02	0.60 ± 0.09	0.51 ± 0.06	0.04 ± 0.01	4.0 ± 0.5
	GKG 29	0.12 ± 0.03	0.21 ± 0.03	0.13 ± 0.02	0.13 ± 0.02	0.60 ± 0.09	0.48 ± 0.06	0.02 ± 0.00	3.2 ± 0.4
	GKG 35	0.06 ± 0.02	0.11 ± 0.02	0.08 ± 0.01	0.07 ± 0.01	0.26 ± 0.04	0.26 ± 0.03	0.02 ± 0.00	2.3 ± 0.3
	GKG 9	0.24 ± 0.06	0.36 ± 0.06	0.26 ± 0.03	0.16 ± 0.03	0.96 ± 0.14	0.75 ± 0.09	0.03 ± 0.00	6.8 ± 0.8
	IR64	0.20 ± 0.05	0.24 ± 0.04	0.16 ± 0.02	0.13 ± 0.02	0.65 ± 0.09	0.52 ± 0.06	0.03 ± 0.00	4.2 ± 0.5
	Jasmine 85	0.10 ± 0.03	0.19 ± 0.03	0.13 ± 0.02	0.12 ± 0.02	0.62 ± 0.09	0.49 ± 0.06	0.02 ± 0.00	2.2 ± 0.3
	Loc Troi 1	0.07 ± 0.02	0.12 ± 0.02	0.08 ± 0.01	0.08 ± 0.01	0.40 ± 0.06	0.24 ± 0.03	0.02 ± 0.00	2.1 ± 0.2
	Loc Troi 5	0.15 ± 0.04	0.22 ± 0.03	0.17 ± 0.02	0.10 ± 0.02	0.58 ± 0.08	0.49 ± 0.06	0.04 ± 0.01	4.9 ± 0.6
	ML202	0.19 ± 0.05	0.20 ± 0.03	0.15 ± 0.02	0.12 ± 0.02	0.57 ± 0.08	0.46 ± 0.06	0.03 ± 0.00	3.7 ± 0.4
	OM18	0.21 ± 0.06	0.26 ± 0.04	0.15 ± 0.02	0.16 ± 0.03	0.79 ± 0.12	0.61 ± 0.08	0.04 ± 0.00	3.8 ± 0.5
	OM2517	0.14 ± 0.04	0.26 ± 0.04	0.21 ± 0.03	0.15 ± 0.03	0.65 ± 0.10	0.62 ± 0.08	0.03 ± 0.00	5.1 ± 0.6
	OM4218	0.10 ± 0.02	0.21 ± 0.03	0.14 ± 0.02	0.11 ± 0.02	0.57 ± 0.08	0.46 ± 0.06	0.02 ± 0.00	3.3 ± 0.4
	OM4900	0.15 ± 0.04	0.21 ± 0.03	0.13 ± 0.02	0.08 ± 0.01	0.56 ± 0.08	0.40 ± 0.05	0.03 ± 0.00	4.2 ± 0.5
	OM5451	0.21 ± 0.05	0.26 ± 0.04	0.16 ± 0.02	0.13 ± 0.02	0.80 ± 0.12	0.68 ± 0.08	0.04 ± 0.01	5.0 ± 0.6
	OM576	0.18 ± 0.05	0.21 ± 0.03	0.14 ± 0.02	0.11 ± 0.02	0.62 ± 0.09	0.52 ± 0.06	0.03 ± 0.00	3.7 ± 0.4
	OM6976	0.12 ± 0.03	0.16 ± 0.03	0.11 ± 0.01	0.08 ± 0.01	0.46 ± 0.07	0.36 ± 0.04	0.02 ± 0.00	2.9 ± 0.3
	OM7347	0.08 ± 0.02	0.13 ± 0.02	0.09 ± 0.01	0.06 ± 0.01	0.31 ± 0.05	0.29 ± 0.04	0.02 ± 0.00	3.1 ± 0.4
	ST24	0.08 ± 0.02	0.16 ± 0.02	0.09 ± 0.01	0.09 ± 0.02	0.46 ± 0.07	0.39 ± 0.05	0.02 ± 0.00	2.1 ± 0.2
50	BTE1	0.02 ± 0.01	0.08 ± 0.01	0.08 ± 0.01	0.07 ± 0.01	0.26 ± 0.04	0.17 ± 0.02	0.09 ± 0.01	2.7 ± 0.3
	Dai Thom 8	0.06 ± 0.02	0.17 ± 0.03	0.15 ± 0.02	0.10 ± 0.02	0.59 ± 0.09	0.33 ± 0.04	0.11 ± 0.01	4.3 ± 0.5
	DS1	0.04 ± 0.01	0.15 ± 0.02	0.13 ± 0.02	0.06 ± 0.01	0.44 ± 0.06	0.31 ± 0.04	0.13 ± 0.02	4.6 ± 0.5
	GKG 29	0.05 ± 0.01	0.11 ± 0.02	0.11 ± 0.01	0.07 ± 0.01	0.34 ± 0.05	0.26 ± 0.03	0.09 ± 0.01	2.6 ± 0.3
	GKG 35	0.05 ± 0.01	0.09 ± 0.01	0.06 ± 0.01	0.04 ± 0.01	0.19 ± 0.03	0.17 ± 0.02	0.09 ± 0.01	2.5 ± 0.3
	GKG 9	0.13 ± 0.03	0.29 ± 0.05	0.23 ± 0.03	0.10 ± 0.02	0.83 ± 0.13	0.50 ± 0.06	0.17 ± 0.02	7.5 ± 0.9
	IR64	0.04 ± 0.01	0.12 ± 0.02	0.13 ± 0.02	0.09 ± 0.02	0.45 ± 0.06	0.28 ± 0.03	0.10 ± 0.01	3.9 ± 0.5
	Jasmine 85	0.06 ± 0.02	0.11 ± 0.02	0.10 ± 0.01	0.09 ± 0.02	0.38 ± 0.05	0.29 ± 0.04	0.09 ± 0.01	2.8 ± 0.3
	Loc Troi 1	0.02 ± 0.00	0.06 ± 0.01	0.06 ± 0.01	0.05 ± 0.01	0.26 ± 0.04	0.13 ± 0.02	0.08 ± 0.01	1.9 ± 0.2
	Loc Troi 5	0.04 ± 0.01	0.10 ± 0.02	0.10 ± 0.01	0.06 ± 0.01	0.34 ± 0.05	0.21 ± 0.03	0.11 ± 0.01	3.5 ± 0.4
	ML202	0.04 ± 0.01	0.11 ± 0.02	0.11 ± 0.01	0.09 ± 0.02	0.40 ± 0.06	0.25 ± 0.03	0.10 ± 0.01	3.7 ± 0.4
	OM18	0.07 ± 0.02	0.11 ± 0.02	0.13 ± 0.02	0.09 ± 0.02	0.46 ± 0.07	0.28 ± 0.03	0.10 ± 0.01	3.5 ± 0.4
	OM2517	0.07 ± 0.02	0.14 ± 0.02	0.11 ± 0.01	0.10 ± 0.02	0.37 ± 0.05	0.27 ± 0.03	0.12 ± 0.01	4.8 ± 0.6
	OM4218	0.06 ± 0.01	0.17 ± 0.03	0.14 ± 0.02	0.09 ± 0.02	0.51 ± 0.07	0.38 ± 0.05	0.12 ± 0.01	3.6 ± 0.4
	OM4900	0.05 ± 0.01	0.15 ± 0.02	0.11 ± 0.01	0.07 ± 0.01	0.40 ± 0.06	0.23 ± 0.03	0.10 ± 0.01	3.7 ± 0.4
	OM5451	0.07 ± 0.02	0.18 ± 0.03	0.13 ± 0.02	0.06 ± 0.01	0.48 ± 0.07	0.37 ± 0.05	0.14 ± 0.02	4.4 ± 0.5
	OM576	0.06 ± 0.02	0.09 ± 0.01	0.08 ± 0.01	0.07 ± 0.01	0.29 ± 0.04	0.18 ± 0.02	0.10 ± 0.01	2.6 ± 0.3
	OM6976	0.03 ± 0.01	0.11 ± 0.02	0.09 ± 0.01	0.06 ± 0.01	0.37 ± 0.06	0.22 ± 0.03	0.07 ± 0.01	3.1 ± 0.4
	OM7347	0.03 ± 0.01	0.07 ± 0.01	0.06 ± 0.01	0.07 ± 0.01	0.19 ± 0.03	0.15 ± 0.02	0.10 ± 0.01	2.4 ± 0.3
	ST24	0.02 ± 0.01	0.08 ± 0.01	0.08 ± 0.01	0.07 ± 0.01	0.34 ± 0.05	0.22 ± 0.03	0.07 ± 0.01	1.9 ± 0.2

APPENDIX 2 (Continued)

Treatment	Variety	L0	L1	L2	L3	S	R	D	T
100	BTE1	0.02 ± 0.01	0.08 ± 0.01	0.09 ± 0.01	0.07 ± 0.01	0.37 ± 0.05	0.17 ± 0.02	0.16 ± 0.02	2.9 ± 0.3
	Dai Thom 8	0.08 ± 0.02	0.15 ± 0.02	0.11 ± 0.02	0.06 ± 0.01	0.49 ± 0.07	0.22 ± 0.03	0.21 ± 0.03	4.0 ± 0.5
	DS1	0.06 ± 0.01	0.12 ± 0.02	0.13 ± 0.02	0.06 ± 0.01	0.41 ± 0.06	0.22 ± 0.03	0.18 ± 0.02	4.0 ± 0.5
	GKG 29	0.06 ± 0.01	0.11 ± 0.02	0.11 ± 0.01	0.02 ± 0.01	0.32 ± 0.05	0.21 ± 0.03	0.18 ± 0.02	2.7 ± 0.3
	GKG 35	0.04 ± 0.01	0.07 ± 0.01	0.06 ± 0.01	NA ± NA	0.12 ± 0.02	0.11 ± 0.01	0.25 ± 0.03	2.3 ± 0.3
	GKG 9	0.11 ± 0.03	0.17 ± 0.03	0.15 ± 0.02	0.07 ± 0.01	0.51 ± 0.07	0.24 ± 0.03	0.24 ± 0.03	4.6 ± 0.5
	IR64	0.03 ± 0.01	0.04 ± 0.01	0.11 ± 0.01	0.09 ± 0.02	0.37 ± 0.05	0.18 ± 0.02	0.18 ± 0.02	3.0 ± 0.3
	Jasmine 85	0.04 ± 0.01	0.07 ± 0.01	0.05 ± 0.01	0.07 ± 0.03	0.20 ± 0.03	0.17 ± 0.02	0.22 ± 0.03	1.6 ± 0.2
	Loc Troi 1	0.02 ± 0.00	0.05 ± 0.01	0.06 ± 0.01	0.08 ± 0.03	0.19 ± 0.03	0.10 ± 0.01	0.16 ± 0.02	1.5 ± 0.2
	Loc Troi 5	0.07 ± 0.02	0.09 ± 0.02	0.08 ± 0.01	0.04 ± 0.01	0.29 ± 0.04	0.19 ± 0.02	0.29 ± 0.04	4.1 ± 0.5
	ML202	0.03 ± 0.01	0.09 ± 0.01	0.11 ± 0.01	0.09 ± 0.02	0.48 ± 0.07	0.22 ± 0.03	0.19 ± 0.02	3.6 ± 0.4
	OM18	0.02 ± 0.01	0.06 ± 0.01	0.13 ± 0.02	0.10 ± 0.02	0.48 ± 0.07	0.20 ± 0.02	0.16 ± 0.02	3.1 ± 0.4
	OM2517	0.06 ± 0.02	0.11 ± 0.02	0.13 ± 0.02	0.10 ± 0.02	0.32 ± 0.05	0.21 ± 0.03	0.27 ± 0.03	4.8 ± 0.5
	OM4218	0.08 ± 0.02	0.13 ± 0.02	0.10 ± 0.01	0.04 ± 0.01	0.40 ± 0.06	0.22 ± 0.03	0.17 ± 0.02	3.3 ± 0.4
	OM4900	0.06 ± 0.01	0.11 ± 0.02	0.08 ± 0.01	0.07 ± 0.03	0.28 ± 0.04	0.12 ± 0.02	0.23 ± 0.03	3.5 ± 0.4
	OM5451	0.09 ± 0.02	0.15 ± 0.02	0.09 ± 0.01	0.06 ± 0.01	0.38 ± 0.05	0.23 ± 0.03	0.20 ± 0.03	4.3 ± 0.5
	OM576	0.04 ± 0.01	0.08 ± 0.01	0.07 ± 0.01	0.07 ± 0.02	0.30 ± 0.04	0.17 ± 0.02	0.29 ± 0.04	3.1 ± 0.4
	OM6976	0.03 ± 0.01	0.09 ± 0.01	0.11 ± 0.01	0.09 ± 0.02	0.36 ± 0.05	0.16 ± 0.02	0.19 ± 0.02	2.6 ± 0.3
	OM7347	0.05 ± 0.01	0.09 ± 0.01	0.09 ± 0.02	0.03 ± 0.01	0.15 ± 0.02	0.11 ± 0.01	0.18 ± 0.02	2.7 ± 0.3
	ST24	0.03 ± 0.01	0.08 ± 0.01	0.08 ± 0.01	0.07 ± 0.02	0.28 ± 0.04	0.15 ± 0.02	0.17 ± 0.02	1.9 ± 0.2

Note: L0 = youngest leaf without a ligule, L1 = the youngest fully developed leaf blade, L2 = second fully developed leaf blade from the top, L3 = third fully developed leaf blade from the top, S = sheaths, R = roots, D = dead leaves, T = tillers. "±" indicates standard error.

APPENDIX 3

Percent of organ weight under 50 mM or 100 mM to 0 mM NaCl by variety.

	TLB		L0		L1		L2	
Variety	50/0	100/0	50/0	100/0	50/0	100/0	50/0	100/0
BTE1	67 ± 12	79 ± 15	55 ± 20	49 ± 18	56 ± 12*	61 ± 13	86 ± 16	93 ± 17
Dai Thom 8	77 ± 14	59 ± 11*	37 ± 13*	52 ± 19	75 ± 17	64 ± 15	102 ± 19	74 ± 14
DS1	63 ± 12*	55 ± 10**	28 ± 10***	42 ± 15*	61 ± 13**	51 ± 11	81 ± 15	77 ± 14
GKG 29	53 ± 10**	47 ± 9***	39 ± 14*	49 ± 17	54 ± 12*	53 ± 12*	85 ± 16	85 ± 16
GKG 35	71 ± 13	44 ± 8***	88 ± 31	61 ± 22	80 ± 18	64 ± 14	84 ± 16	82 ± 19
GKG 9	76 ± 14	45 ± 8***	52 ± 19	46 ± 16	82 ± 18	46 ± 10**	86 ± 16	58 ± 11**
IR64	58 ± 11**	42 ± 8***	23 ± 8***	14 ± 5***	49 ± 11**	18 ± 4***	78 ± 14	64 ± 12*
Jasmine 85	62 ± 11*	30 ± 6***	61 ± 22	39 ± 14*	55 ± 12*	36 ± 8***	78 ± 14	42 ± 9***
Loc Troi 1	59 ± 11*	43 ± 8***	21 ± 8***	25 ± 9***	50 ± 11**	43 ± 9***	74 ± 14	75 ± 15
Loc Troi 5	49 ± 9***	42 ± 8***	24 ± 9***	46 ± 17	47 ± 10**	43 ± 10***	59 ± 11**	49 ± 9***
ML202	59 ± 11*	61 ± 11*	22 ± 8***	17 ± 6***	54 ± 12*	42 ± 9***	75 ± 14	77 ± 14
OM18	54 ± 10**	46 ± 8***	31 ± 11**	11 ± 4***	43 ± 10***	23 ± 5***	87 ± 16	86 ± 16
OM2517	52 ± 10**	44 ± 8***	53 ± 19	43 ± 16*	52 ± 12**	40 ± 9***	50 ± 9***	63 ± 12*
OM4218	84 ± 16	59 ± 11*	60 ± 22	81 ± 29	80 ± 18	61 ± 13	100 ± 19	71 ± 13
OM4900	66 ± 12	42 ± 8***	33 ± 12**	37 ± 14*	73 ± 16	52 ± 12**	84 ± 16	64 ± 13
OM5451	59 ± 11*	44 ± 8***	34 ± 13**	43 ± 15*	71 ± 16	56 ± 12*	82 ± 15	55 ± 10**
OM576	43 ± 8***	38 ± 7***	34 ± 12**	21 ± 8***	40 ± 9***	39 ± 9***	59 ± 11*	50 ± 10**
OM6976	68 ± 13	60 ± 11*	21 ± 8***	27 ± 10***	71 ± 16	55 ± 12*	80 ± 15	105 ± 19
OM7347	57 ± 10**	45 ± 8***	33 ± 12**	57 ± 21	54 ± 12*	68 ± 15	68 ± 13	109 ± 25
ST24	64 ± 12*	51 ± 9**	27 ± 10***	32 ± 12**	53 ± 12*	48 ± 11**	88 ± 16	86 ± 16
Mean	61 ± 6***	48 ± 5***	36 ± 4**	35 ± 4***	59 ± 7*	46 ± 5**	78 ± 6*	71 ± 5**

Note: L0 = youngest leaf without a ligule, L1 = the youngest fully developed leaf blade, L2 = second fully developed leaf blade from the top, L3 = fully developed leaf blade from the top, S = sheaths, R = roots, D = dead leaves, TLB = total living biomass. "±" indicates standard error. The percentage was the ratio of the treatments (50 mM, 100 mM) to 0 mM NaCl*100. Significances reflect the difference between 0 mM and either 50 mM or 100 mM NaCl. The level of significance is designated accordingly: ***, <0.001; **, <0.01; *, <0.05.

L3		S		R		D	
50/0	100/0	50/0	100/0	50/0	100/0	50/0	100/0
74 ± 18	73 ± 18	76 ± 15	105 ± 21	63 ± 11*	64 ± 11*	460 ± 87***	847 ± 161***
88 ± 21	48 ± 13*	80 ± 16	66 ± 14	72 ± 12	46 ± 8***	458 ± 82***	891 ± 164***
50 ± 12**	47 ± 13*	73 ± 15	68 ± 14	60 ± 10**	44 ± 7***	337 ± 60***	459 ± 82***
59 ± 15	19 ± 6***	58 ± 12*	54 ± 11**	54 ± 9***	43 ± 7***	464 ± 85***	868 ± 155***
53 ± 13*	–	72 ± 15	47 ± 9***	67 ± 11*	43 ± 7***	484 ± 87***	1307 ± 234***
63 ± 16	45 ± 11**	87 ± 18	53 ± 11**	67 ± 11*	31 ± 5***	493 ± 90***	695 ± 124***
70 ± 17	68 ± 17	69 ± 14	57 ± 12*	54 ± 9***	34 ± 6***	353 ± 63***	612 ± 110***
75 ± 18	63 ± 31	62 ± 12*	32 ± 6***	59 ± 10**	34 ± 6***	578 ± 103***	1347 ± 241***
65 ± 16	98 ± 36	65 ± 13	49 ± 10**	56 ± 9**	44 ± 7***	552 ± 99***	1020 ± 182***
59 ± 15	34 ± 10***	58 ± 12*	49 ± 10**	42 ± 7***	38 ± 7***	245 ± 44***	663 ± 122***
78 ± 19	79 ± 19	70 ± 14	84 ± 17	54 ± 9***	48 ± 8***	353 ± 63***	641 ± 115***
61 ± 15	64 ± 16	59 ± 12*	61 ± 13*	46 ± 8***	33 ± 6***	273 ± 50***	423 ± 78***
67 ± 16	69 ± 18	57 ± 12*	50 ± 10**	44 ± 8***	34 ± 6***	421 ± 77***	970 ± 178***
80 ± 19	35 ± 9***	89 ± 18	69 ± 14	81 ± 14	48 ± 8***	645 ± 116***	934 ± 167***
86 ± 21	94 ± 46	72 ± 15	51 ± 10**	57 ± 10**	31 ± 5***	333 ± 61***	729 ± 134***
48 ± 12**	51 ± 14*	60 ± 12*	47 ± 9***	55 ± 10**	34 ± 6***	356 ± 65***	505 ± 90***
67 ± 17	69 ± 22	46 ± 9***	48 ± 10**	35 ± 6***	33 ± 6***	368 ± 66***	1089 ± 200***
73 ± 18	107 ± 28	79 ± 16	77 ± 15	60 ± 11**	45 ± 8***	324 ± 60***	830 ± 148***
108 ± 27	45 ± 13*	61 ± 12*	49 ± 10**	53 ± 9***	37 ± 6***	448 ± 80***	818 ± 146***
72 ± 17	75 ± 22	75 ± 15	62 ± 12*	56 ± 10**	40 ± 7***	316 ± 57***	714 ± 128***
69 ± 8*	63 ± 7**	68 ± 7*	57 ± 6**	56 ± 5***	40 ± 3***	401 ± 29***	782 ± 57***

APPENDIX 4

Mean slopes of linear regressions of log transformed organ weight (g) to NaCl treatment (converted to M from mM) by variety.

Variety	TLB	L0*	L1	L2	L3	S	R	D
BTE1	−2.40 ± 1.87^{b}	−7.10 ± 4.20^{ab}	−4.95 ± 2.26^{bc}	−0.70 ± 1.86^{a}	−3.33 ± 2.45^{ab}	0.42 ± 2.03^{b}	−4.61 ± 1.75^{a}	21.2 ± 2.46^{abc}
ML202	−4.79 ± 1.86^{ab}	−17.8 ± 4.20^{ab}	−8.55 ± 2.26^{abc}	−2.58 ± 1.86^{a}	−2.41 ± 2.43^{b}	−1.71 ± 2.02^{b}	−7.17 ± 1.75^{a}	18.6 ± 2.38^{abc}
OM6976	−5.10 ± 1.87^{ab}	−13.6 ± 4.30^{ab}	−5.91 ± 2.32^{bc}	0.53 ± 1.86^{a}	0.34 ± 2.62^{b}	−2.65 ± 2.03^{ab}	−8.06 ± 1.75^{a}	21.0 ± 2.38^{abc}
OM4218	−5.26 ± 1.87^{ab}	−2.12 ± 4.20^{b}	−5.03 ± 2.26^{bc}	−3.36 ± 1.91^{a}	−9.62 ± 2.71^{ab}	−3.68 ± 2.03^{ab}	−7.41 ± 1.75^{a}	22.4 ± 2.38^{abc}
Dai Thom 8	−5.28 ± 1.93^{ab}	−6.53 ± 4.31^{ab}	−4.50 ± 2.33^{bc}	−3.01 ± 1.93^{a}	−6.47 ± 2.74^{ab}	−4.08 ± 2.10^{ab}	−7.69 ± 1.82^{a}	22.0 ± 2.42^{abc}
DS1	−5.92 ± 1.87^{ab}	−8.61 ± 4.20^{ab}	−6.59 ± 2.26^{bc}	−2.64 ± 1.86^{a}	−8.24 ± 2.71^{ab}	−3.80 ± 2.03^{ab}	−8.23 ± 1.76^{a}	15.3 ± 2.38^{ab}
ST24	−6.85 ± 1.86^{ab}	−11.3 ± 4.20^{ab}	−7.29 ± 2.26^{abc}	−1.60 ± 1.91^{a}	−3.44 ± 2.86^{ab}	−4.95 ± 2.02^{ab}	−9.38 ± 1.75^{a}	19.6 ± 2.38^{abc}
OM18	−7.67 ± 1.89^{ab}	−21.4 ± 4.47^{a}	−14.6 ± 2.30^{ab}	−1.43 ± 1.90^{a}	−4.25 ± 2.42^{ab}	−4.67 ± 2.05^{ab}	−10.9 ± 1.77^{a}	14.5 ± 2.41^{a}
GKG 29	−7.70 ± 1.86^{ab}	−7.28 ± 4.20^{ab}	−6.40 ± 2.26^{bc}	−1.64 ± 1.91^{a}	−15.4 ± 2.84^{a}	−6.14 ± 2.02^{ab}	−8.50 ± 1.75^{a}	21.6 ± 2.38^{abc}
OM7347	−7.86 ± 1.88^{ab}	−5.51 ± 4.21^{ab}	−3.79 ± 2.27^{c}	−0.38 ± 2.26^{a}	−6.23 ± 2.87^{ab}	−7.00 ± 2.04^{ab}	−9.74 ± 1.76^{a}	21.0 ± 2.38^{abc}
GKG 9	−7.93 ± 1.87^{ab}	−7.85 ± 4.20^{ab}	−7.65 ± 2.26^{abc}	−5.31 ± 1.86^{a}	−7.96 ± 2.44^{ab}	−6.26 ± 2.03^{ab}	−11.4 ± 1.76^{a}	19.3 ± 2.38^{abc}
OM2517	−8.11 ± 1.91^{ab}	−8.47 ± 4.29^{ab}	−8.94 ± 2.31^{abc}	−4.39 ± 1.91^{a}	−3.94 ± 2.66^{ab}	−6.88 ± 2.08^{ab}	−10.8 ± 1.8^{a}	22.7 ± 2.42^{abc}
GKG 35	−8.20 ± 1.86^{ab}	−4.85 ± 4.19^{ab}	−4.35 ± 2.30^{c}	−1.97 ± 2.25^{a}	−10.9 ± 4.65^{ab}	−7.54 ± 2.02^{ab}	−8.39 ± 1.74^{a}	25.7 ± 2.38^{c}

(Continues)

APPENDIX 4 (Continued)

Variety	TLB	L0*	L1	L2	L3	S	R	D
OM5451	-8.25 ± 1.87^{ab}	-8.44 ± 4.20^{ab}	-5.96 ± 2.26^{bc}	-6.12 ± 1.86^{a}	-7.56 ± 2.72^{ab}	-7.62 ± 2.03^{ab}	-10.8 ± 1.76^{a}	16.2 ± 2.38^{ab}
Loc Troi 1	-8.56 ± 1.86^{ab}	-13.9 ± 4.28^{ab}	-8.54 ± 2.26^{abc}	-2.98 ± 1.97^{a}	-2.57 ± 3.32^{ab}	-7.25 ± 2.02^{ab}	-8.31 ± 1.75^{a}	23.3 ± 2.38^{bc}
Loc Troi 5	-8.66 ± 1.88^{ab}	-8.03 ± 4.27^{ab}	-8.51 ± 2.30^{abc}	-7.31 ± 1.96^{a}	-10.5 ± 2.83^{ab}	-7.16 ± 2.05^{ab}	-9.86 ± 1.77^{a}	18.7 ± 2.41^{abc}
IR64	-8.72 ± 1.87^{ab}	-19.8 ± 4.29^{a}	-16.9 ± 2.38^{a}	-4.38 ± 1.86^{a}	-3.83 ± 2.44^{ab}	-5.63 ± 2.03^{ab}	-10.8 ± 1.76^{a}	18.1 ± 2.38^{abc}
OM4900	-8.79 ± 1.90^{ab}	-9.97 ± 4.28^{ab}	-6.65 ± 2.31^{abc}	-4.40 ± 2.02^{a}	-1.27 ± 3.84^{ab}	-6.80 ± 2.07^{ab}	-11.8 ± 1.79^{a}	19.9 ± 2.41^{abc}
OM576	-9.69 ± 1.91^{ab}	-15.7 ± 4.29^{ab}	-9.57 ± 2.31^{abc}	-7.09 ± 1.98^{a}	-4.37 ± 3.04^{ab}	-7.54 ± 2.08^{ab}	-11.3 ± 1.80^{a}	23.8 ± 2.42^{bc}
Jasmine 85	-11.9 ± 1.86^{a}	-9.55 ± 4.20^{ab}	-10.2 ± 2.31^{abc}	-8.12 ± 2.14^{a}	-4.49 ± 3.75^{ab}	-11.3 ± 2.02^{a}	-10.9 ± 1.75^{a}	26.0 ± 2.38^{c}

Note: L0 = youngest leaf without a ligule, L1 = the youngest fully developed leaf blade, L2 = second fully developed leaf blade from the top, L3 = third fully developed leaf blade from the top, S = sheaths, R = roots, D = dead leaves, TLB = total living biomass. Slopes were arranged in descending order according to TLB slopes. Marginal means by variety not sharing any letter are significantly different by Tukey's test at the 5% level of significance. "±" indicates standard error. *The relationship between L0 and NaCl treatment was not significantly linear.

APPENDIX 5

Mean ion (Cl−, K+, Na+) content and concentration by organ and NaCl treatment.

Variety	Ion	Organ	Content (mmoL)			Concentration (mmol g^{-1})		
BTE1	Cl^-	L0	0.009 ± 0.002	0.010 ± 0.003	0.015 ± 0.004	0.20 ± 0.03	0.43 ± 0.05	0.70 ± 0.09
		L1	0.045 ± 0.007	0.070 ± 0.011	0.068 ± 0.011	0.33 ± 0.04	0.89 ± 0.11	0.82 ± 0.10
		L2	0.037 ± 0.006	0.086 ± 0.014	0.089 ± 0.014	0.37 ± 0.04	1.01 ± 0.11	0.97 ± 0.11
		L3	0.030 ± 0.005	0.051 ± 0.009	0.093 ± 0.016	0.32 ± 0.03	0.72 ± 0.08	1.30 ± 0.14
		S	0.154 ± 0.021	0.279 ± 0.037	0.360 ± 0.048	0.45 ± 0.04	1.06 ± 0.09	0.99 ± 0.09
		R	0.112 ± 0.016	0.100 ± 0.014	0.121 ± 0.018	0.41 ± 0.03	0.59 ± 0.04	0.69 ± 0.05
		D	0.017 ± 0.003	0.118 ± 0.018	0.422 ± 0.065	0.92 ± 0.13	1.38 ± 0.17	2.69 ± 0.33
BTE1	K^+	L0	0.020 ± 0.005	0.018 ± 0.005	0.018 ± 0.005	0.45 ± 0.04	0.73 ± 0.06	0.81 ± 0.07
		L1	0.106 ± 0.018	0.073 ± 0.013	0.078 ± 0.014	0.78 ± 0.07	0.94 ± 0.08	0.96 ± 0.08
		L2	0.070 ± 0.010	0.064 ± 0.009	0.069 ± 0.010	0.72 ± 0.05	0.75 ± 0.05	0.75 ± 0.05
		L3	0.060 ± 0.011	0.048 ± 0.009	0.045 ± 0.008	0.64 ± 0.05	0.67 ± 0.06	0.64 ± 0.06
		S	0.347 ± 0.057	0.216 ± 0.035	0.217 ± 0.036	0.99 ± 0.07	0.80 ± 0.06	0.58 ± 0.04
		R	0.114 ± 0.016	0.085 ± 0.012	0.071 ± 0.010	0.42 ± 0.02	0.50 ± 0.02	0.41 ± 0.02
		D	0.003 ± 0.001	0.041 ± 0.007	0.105 ± 0.019	0.15 ± 0.02	0.47 ± 0.05	0.66 ± 0.07
BTE1	Na^+	L0	0.000 ± 0.000	0.003 ± 0.001	0.008 ± 0.002	0.01 ± 0.00	0.11 ± 0.03	0.38 ± 0.08
		L1	0.000 ± 0.000	0.029 ± 0.006	0.029 ± 0.006	0.00 ± 0.00	0.37 ± 0.07	0.35 ± 0.07
		L2	0.001 ± 0.000	0.033 ± 0.008	0.037 ± 0.009	0.01 ± 0.00	0.38 ± 0.08	0.39 ± 0.08
		L3	0.003 ± 0.001	0.018 ± 0.004	0.063 ± 0.013	0.03 ± 0.01	0.26 ± 0.05	0.88 ± 0.17
		S	0.034 ± 0.004	0.269 ± 0.034	0.381 ± 0.049	0.10 ± 0.01	1.01 ± 0.08	1.02 ± 0.08
		R	0.110 ± 0.015	0.122 ± 0.016	0.163 ± 0.022	0.41 ± 0.02	0.72 ± 0.03	0.93 ± 0.04
		D	0.004 ± 0.001	0.246 ± 0.029	0.449 ± 0.052	0.22 ± 0.02	2.91 ± 0.26	2.85 ± 0.26
Dai Thom 8	Cl^-	L0	0.035 ± 0.009	0.022 ± 0.006	0.037 ± 0.010	0.22 ± 0.03	0.37 ± 0.04	0.43 ± 0.06
		L1	0.075 ± 0.012	0.073 ± 0.011	0.107 ± 0.017	0.32 ± 0.04	0.42 ± 0.05	0.72 ± 0.10
		L2	0.049 ± 0.008	0.107 ± 0.017	0.098 ± 0.017	0.32 ± 0.04	0.70 ± 0.08	0.89 ± 0.10
		L3	0.041 ± 0.007	0.097 ± 0.016	0.060 ± 0.013	0.35 ± 0.04	0.97 ± 0.10	1.03 ± 0.14
		S	0.272 ± 0.037	0.520 ± 0.069	0.436 ± 0.061	0.36 ± 0.03	0.87 ± 0.08	0.88 ± 0.08
		R	0.174 ± 0.026	0.214 ± 0.031	0.153 ± 0.023	0.36 ± 0.03	0.63 ± 0.04	0.71 ± 0.05
		D	0.016 ± 0.003	0.266 ± 0.041	0.546 ± 0.089	0.70 ± 0.09	2.52 ± 0.31	2.67 ± 0.34

APPENDIX 5 (Continued)

Variety	Ion	Organ	Content (mmoL)			Concentration (mmol g^{-1})		
Dai Thom 8	K^+	L0	0.079 ± 0.022	0.043 ± 0.012	0.058 ± 0.017	0.49 ± 0.04	0.71 ± 0.06	0.69 ± 0.06
		L1	0.117 ± 0.020	0.120 ± 0.021	0.095 ± 0.017	0.47 ± 0.04	0.67 ± 0.06	0.63 ± 0.06
		L2	0.078 ± 0.012	0.089 ± 0.013	0.066 ± 0.010	0.49 ± 0.03	0.57 ± 0.04	0.60 ± 0.04
		L3	0.054 ± 0.010	0.058 ± 0.010	0.025 ± 0.006	0.46 ± 0.04	0.57 ± 0.05	0.44 ± 0.05
		S	0.491 ± 0.081	0.406 ± 0.067	0.271 ± 0.046	0.63 ± 0.04	0.68 ± 0.05	0.55 ± 0.04
		R	0.151 ± 0.021	0.179 ± 0.025	0.075 ± 0.011	0.32 ± 0.01	0.52 ± 0.03	0.34 ± 0.02
		D	0.003 ± 0.001	0.054 ± 0.010	0.123 ± 0.023	0.13 ± 0.01	0.51 ± 0.05	0.60 ± 0.06
Dai Thom 8	Na^+	L0	0.004 ± 0.001	0.007 ± 0.002	0.017 ± 0.004	0.02 ± 0.01	0.12 ± 0.03	0.20 ± 0.05
		L1	0.005 ± 0.001	0.022 ± 0.004	0.046 ± 0.009	0.02 ± 0.00	0.12 ± 0.02	0.31 ± 0.06
		L2	0.005 ± 0.001	0.035 ± 0.008	0.047 ± 0.012	0.03 ± 0.01	0.23 ± 0.05	0.43 ± 0.10
		L3	0.005 ± 0.001	0.045 ± 0.009	0.033 ± 0.009	0.04 ± 0.01	0.45 ± 0.08	0.57 ± 0.14
		S	0.053 ± 0.007	0.374 ± 0.048	0.408 ± 0.055	0.07 ± 0.01	0.65 ± 0.05	0.86 ± 0.07
		R	0.154 ± 0.021	0.231 ± 0.031	0.189 ± 0.026	0.34 ± 0.01	0.70 ± 0.03	0.88 ± 0.04
		D	0.006 ± 0.001	0.202 ± 0.024	0.448 ± 0.055	0.27 ± 0.03	1.92 ± 0.17	2.21 ± 0.21
DS1	Cl^-	L0	0.049 ± 0.012	0.020 ± 0.005	0.030 ± 0.008	0.35 ± 0.04	0.50 ± 0.06	0.51 ± 0.06
		L1	0.124 ± 0.019	0.118 ± 0.018	0.110 ± 0.017	0.52 ± 0.07	0.83 ± 0.10	0.93 ± 0.12
		L2	0.082 ± 0.013	0.171 ± 0.027	0.182 ± 0.029	0.49 ± 0.06	1.27 ± 0.14	1.44 ± 0.16
		L3	0.063 ± 0.010	0.072 ± 0.012	0.088 ± 0.019	0.49 ± 0.05	1.15 ± 0.12	1.55 ± 0.21
		S	0.354 ± 0.047	0.571 ± 0.075	0.581 ± 0.077	0.59 ± 0.05	1.29 ± 0.11	1.44 ± 0.13
		R	0.263 ± 0.038	0.293 ± 0.042	0.196 ± 0.028	0.51 ± 0.04	0.95 ± 0.07	0.90 ± 0.06
		D	0.038 ± 0.006	0.461 ± 0.071	0.529 ± 0.081	0.94 ± 0.11	3.42 ± 0.42	2.87 ± 0.35
DS1	K^+	L0	0.094 ± 0.026	0.032 ± 0.009	0.048 ± 0.013	0.68 ± 0.06	0.80 ± 0.07	0.83 ± 0.07
		L1	0.169 ± 0.029	0.111 ± 0.019	0.096 ± 0.017	0.72 ± 0.06	0.76 ± 0.07	0.80 ± 0.07
		L2	0.114 ± 0.017	0.100 ± 0.015	0.090 ± 0.013	0.69 ± 0.05	0.75 ± 0.05	0.71 ± 0.05
		L3	0.077 ± 0.014	0.039 ± 0.007	0.039 ± 0.009	0.61 ± 0.05	0.62 ± 0.05	0.67 ± 0.07
		S	0.603 ± 0.099	0.396 ± 0.065	0.322 ± 0.053	0.99 ± 0.07	0.91 ± 0.06	0.80 ± 0.06
		R	0.170 ± 0.024	0.173 ± 0.024	0.096 ± 0.013	0.34 ± 0.02	0.56 ± 0.03	0.43 ± 0.02
		D	0.018 ± 0.003	0.096 ± 0.017	0.130 ± 0.023	0.46 ± 0.04	0.72 ± 0.07	0.70 ± 0.07
DS1	Na^+	L0	0.004 ± 0.001	0.008 ± 0.002	0.010 ± 0.002	0.03 ± 0.01	0.20 ± 0.04	0.17 ± 0.04
		L1	0.009 ± 0.002	0.042 ± 0.008	0.041 ± 0.008	0.04 ± 0.01	0.30 ± 0.06	0.34 ± 0.07
		L2	0.006 ± 0.001	0.080 ± 0.018	0.075 ± 0.017	0.04 ± 0.01	0.62 ± 0.13	0.60 ± 0.13
		L3	0.005 ± 0.001	0.026 ± 0.005	0.033 ± 0.008	0.04 ± 0.01	0.41 ± 0.08	0.60 ± 0.14
		S	0.076 ± 0.010	0.399 ± 0.051	0.417 ± 0.054	0.12 ± 0.01	0.92 ± 0.07	1.03 ± 0.08
		R	0.261 ± 0.034	0.266 ± 0.035	0.210 ± 0.028	0.51 ± 0.02	0.86 ± 0.04	0.94 ± 0.04
		D	0.010 ± 0.001	0.359 ± 0.042	0.422 ± 0.049	0.26 ± 0.02	2.66 ± 0.24	2.30 ± 0.21
GKG 29	Cl^-	L0	0.035 ± 0.009	0.020 ± 0.005	0.034 ± 0.009	0.30 ± 0.04	0.43 ± 0.06	0.60 ± 0.07
		L1	0.071 ± 0.011	0.070 ± 0.011	0.092 ± 0.014	0.34 ± 0.04	0.61 ± 0.08	0.82 ± 0.10
		L2	0.041 ± 0.007	0.079 ± 0.013	0.122 ± 0.020	0.33 ± 0.04	0.71 ± 0.08	1.11 ± 0.13
		L3	0.033 ± 0.006	0.074 ± 0.014	0.034 ± 0.008	0.26 ± 0.03	0.99 ± 0.12	1.41 ± 0.22
		S	0.329 ± 0.043	0.376 ± 0.052	0.460 ± 0.061	0.57 ± 0.05	1.08 ± 0.10	1.44 ± 0.13
		R	0.204 ± 0.029	0.158 ± 0.024	0.141 ± 0.020	0.43 ± 0.03	0.61 ± 0.04	0.70 ± 0.05
		D	0.016 ± 0.002	0.331 ± 0.054	0.548 ± 0.084	0.77 ± 0.09	3.52 ± 0.46	3.12 ± 0.38

(Continues)

APPENDIX 5 (Continued)

Variety	Ion	Organ	Content (mmoL)			Concentration (mmol g^{-1})		
GKG 29	K^+	L0	0.059 ± 0.016	0.030 ± 0.009	0.032 ± 0.009	0.50 ± 0.04	0.65 ± 0.06	0.57 ± 0.05
		L1	0.100 ± 0.017	0.073 ± 0.013	0.064 ± 0.011	0.49 ± 0.04	0.64 ± 0.06	0.59 ± 0.05
		L2	0.060 ± 0.009	0.055 ± 0.008	0.053 ± 0.008	0.48 ± 0.03	0.49 ± 0.03	0.49 ± 0.03
		L3	0.039 ± 0.007	0.037 ± 0.007	0.012 ± 0.003	0.30 ± 0.03	0.49 ± 0.04	0.51 ± 0.06
		S	0.443 ± 0.073	0.211 ± 0.036	0.129 ± 0.021	0.76 ± 0.05	0.59 ± 0.04	0.41 ± 0.03
		R	0.171 ± 0.024	0.099 ± 0.014	0.048 ± 0.007	0.36 ± 0.02	0.39 ± 0.02	0.24 ± 0.01
		D	0.005 ± 0.001	0.040 ± 0.008	0.092 ± 0.016	0.24 ± 0.02	0.43 ± 0.04	0.52 ± 0.05
GKG 29	Na^+	L0	0.005 ± 0.001	0.010 ± 0.003	0.024 ± 0.006	0.04 ± 0.01	0.21 ± 0.05	0.42 ± 0.09
		L1	0.005 ± 0.001	0.027 ± 0.006	0.052 ± 0.010	0.03 ± 0.01	0.24 ± 0.05	0.47 ± 0.09
		L2	0.005 ± 0.001	0.043 ± 0.010	0.075 ± 0.018	0.04 ± 0.01	0.38 ± 0.08	0.67 ± 0.15
		L3	0.008 ± 0.002	0.042 ± 0.009	0.026 ± 0.007	0.07 ± 0.01	0.56 ± 0.12	1.07 ± 0.29
		S	0.059 ± 0.008	0.306 ± 0.041	0.392 ± 0.050	0.10 ± 0.01	0.86 ± 0.07	1.18 ± 0.09
		R	0.146 ± 0.019	0.152 ± 0.021	0.145 ± 0.019	0.30 ± 0.01	0.59 ± 0.03	0.70 ± 0.03
		D	0.007 ± 0.001	0.206 ± 0.025	0.410 ± 0.048	0.37 ± 0.03	2.22 ± 0.21	2.32 ± 0.21
GKG 35	Cl^-	L0	0.015 ± 0.004	0.031 ± 0.008	0.064 ± 0.016	0.25 ± 0.03	0.58 ± 0.07	1.73 ± 0.21
		L1	0.043 ± 0.007	0.086 ± 0.013	0.181 ± 0.029	0.37 ± 0.05	0.95 ± 0.12	2.50 ± 0.33
		L2	0.025 ± 0.004	0.073 ± 0.012	0.156 ± 0.036	0.33 ± 0.04	1.13 ± 0.12	2.55 ± 0.41
		L3	0.025 ± 0.004	0.072 ± 0.013	-	0.35 ± 0.04	1.84 ± 0.20	-
		S	0.153 ± 0.020	0.336 ± 0.045	0.311 ± 0.041	0.58 ± 0.05	1.73 ± 0.15	2.59 ± 0.23
		R	0.114 ± 0.016	0.116 ± 0.017	0.077 ± 0.011	0.45 ± 0.03	0.67 ± 0.05	0.69 ± 0.05
		D	0.014 ± 0.002	0.286 ± 0.044	0.800 ± 0.123	0.76 ± 0.09	3.12 ± 0.38	3.24 ± 0.40
GKG 35	K^+	L0	0.034 ± 0.009	0.041 ± 0.011	0.038 ± 0.010	0.56 ± 0.05	0.76 ± 0.06	1.01 ± 0.08
		L1	0.071 ± 0.012	0.075 ± 0.013	0.096 ± 0.017	0.62 ± 0.05	0.83 ± 0.07	1.33 ± 0.12
		L2	0.043 ± 0.006	0.053 ± 0.008	0.092 ± 0.019	0.58 ± 0.04	0.83 ± 0.06	1.50 ± 0.13
		L3	0.032 ± 0.006	0.039 ± 0.007	-	0.44 ± 0.04	1.02 ± 0.09	-
		S	0.239 ± 0.039	0.201 ± 0.033	0.058 ± 0.010	0.92 ± 0.06	1.04 ± 0.07	0.49 ± 0.03
		R	0.100 ± 0.014	0.082 ± 0.012	0.030 ± 0.004	0.39 ± 0.02	0.48 ± 0.02	0.27 ± 0.01
		D	0.002 ± 0.000	0.072 ± 0.013	0.244 ± 0.043	0.11 ± 0.01	0.78 ± 0.08	0.98 ± 0.10
GKG 35	Na^+	L0	0.004 ± 0.001	0.007 ± 0.002	0.030 ± 0.007	0.06 ± 0.01	0.13 ± 0.03	0.83 ± 0.18
		L1	0.003 ± 0.001	0.024 ± 0.005	0.067 ± 0.014	0.03 ± 0.01	0.27 ± 0.05	0.92 ± 0.19
		L2	0.003 ± 0.001	0.024 ± 0.006	0.048 ± 0.016	0.04 ± 0.01	0.38 ± 0.08	0.78 ± 0.24
		L3	0.003 ± 0.001	0.031 ± 0.006	-	0.05 ± 0.01	0.80 ± 0.15	-
		S	0.032 ± 0.004	0.215 ± 0.028	0.282 ± 0.036	0.12 ± 0.01	1.11 ± 0.09	2.30 ± 0.18
		R	0.091 ± 0.012	0.134 ± 0.018	0.111 ± 0.015	0.36 ± 0.01	0.78 ± 0.03	1.00 ± 0.04
		D	0.006 ± 0.001	0.188 ± 0.022	0.498 ± 0.058	0.33 ± 0.03	2.04 ± 0.18	2.01 ± 0.18
GKG 9	Cl^-	L0	0.080 ± 0.020	0.051 ± 0.014	0.057 ± 0.014	0.33 ± 0.04	0.40 ± 0.05	0.51 ± 0.06
		L1	0.137 ± 0.021	0.162 ± 0.026	0.108 ± 0.017	0.38 ± 0.05	0.56 ± 0.07	0.65 ± 0.08
		L2	0.098 ± 0.016	0.181 ± 0.030	0.159 ± 0.026	0.37 ± 0.04	0.79 ± 0.09	1.06 ± 0.12
		L3	0.065 ± 0.011	0.082 ± 0.015	0.093 ± 0.016	0.40 ± 0.04	0.78 ± 0.09	1.25 ± 0.14
		S	0.470 ± 0.063	0.826 ± 0.114	0.621 ± 0.083	0.48 ± 0.04	0.98 ± 0.09	1.20 ± 0.11
		R	0.365 ± 0.053	0.337 ± 0.051	0.166 ± 0.024	0.49 ± 0.03	0.68 ± 0.05	0.69 ± 0.05
		D	0.030 ± 0.005	0.549 ± 0.089	0.859 ± 0.132	0.87 ± 0.11	3.17 ± 0.41	3.53 ± 0.43

APPENDIX 5 (Continued)

Variety	Ion	Organ	Content (mmoL)			Concentration (mmol g^{-1})		
GKG 9	K^+	L0	0.124 ± 0.034	0.094 ± 0.027	0.078 ± 0.021	0.52 ± 0.04	0.74 ± 0.06	0.70 ± 0.06
		L1	0.169 ± 0.029	0.210 ± 0.038	0.129 ± 0.022	0.46 ± 0.04	0.70 ± 0.06	0.74 ± 0.06
		L2	0.122 ± 0.018	0.133 ± 0.021	0.101 ± 0.015	0.46 ± 0.03	0.58 ± 0.04	0.64 ± 0.04
		L3	0.072 ± 0.013	0.057 ± 0.011	0.039 ± 0.007	0.44 ± 0.04	0.56 ± 0.05	0.54 ± 0.05
		S	0.742 ± 0.122	0.650 ± 0.111	0.361 ± 0.059	0.76 ± 0.05	0.77 ± 0.05	0.69 ± 0.05
		R	0.277 ± 0.039	0.253 ± 0.037	0.086 ± 0.012	0.36 ± 0.02	0.49 ± 0.03	0.35 ± 0.02
		D	0.007 ± 0.001	0.091 ± 0.017	0.147 ± 0.026	0.21 ± 0.02	0.53 ± 0.06	0.61 ± 0.06
GKG 9	Na^+	L0	0.009 ± 0.002	0.018 ± 0.005	0.016 ± 0.004	0.04 ± 0.01	0.14 ± 0.03	0.14 ± 0.03
		L1	0.014 ± 0.003	0.055 ± 0.011	0.043 ± 0.008	0.04 ± 0.01	0.19 ± 0.04	0.26 ± 0.05
		L2	0.010 ± 0.002	0.084 ± 0.020	0.068 ± 0.016	0.04 ± 0.01	0.37 ± 0.08	0.46 ± 0.10
		L3	0.009 ± 0.002	0.029 ± 0.006	0.047 ± 0.010	0.05 ± 0.01	0.27 ± 0.06	0.62 ± 0.12
		S	0.090 ± 0.012	0.558 ± 0.074	0.438 ± 0.056	0.09 ± 0.01	0.68 ± 0.06	0.88 ± 0.07
		R	0.269 ± 0.036	0.356 ± 0.049	0.184 ± 0.025	0.36 ± 0.01	0.71 ± 0.03	0.79 ± 0.03
		D	0.011 ± 0.001	0.351 ± 0.043	0.586 ± 0.068	0.31 ± 0.03	2.04 ± 0.19	2.39 ± 0.21
IR64	Cl^-	L0	0.057 ± 0.015	0.021 ± 0.005	0.015 ± 0.005	0.29 ± 0.04	0.48 ± 0.06	0.48 ± 0.07
		L1	0.086 ± 0.013	0.081 ± 0.012	0.030 ± 0.005	0.35 ± 0.04	0.68 ± 0.09	0.89 ± 0.12
		L2	0.051 ± 0.008	0.101 ± 0.016	0.090 ± 0.014	0.31 ± 0.03	0.79 ± 0.09	0.85 ± 0.09
		L3	0.044 ± 0.007	0.066 ± 0.011	0.119 ± 0.021	0.35 ± 0.04	0.75 ± 0.08	1.39 ± 0.15
		S	0.285 ± 0.038	0.436 ± 0.057	0.390 ± 0.052	0.44 ± 0.04	1.00 ± 0.09	1.06 ± 0.09
		R	0.226 ± 0.033	0.166 ± 0.024	0.121 ± 0.017	0.44 ± 0.03	0.59 ± 0.04	0.67 ± 0.05
		D	0.023 ± 0.004	0.290 ± 0.044	0.493 ± 0.076	0.81 ± 0.10	2.85 ± 0.35	2.81 ± 0.34
IR64	K^+	L0	0.108 ± 0.030	0.033 ± 0.009	0.019 ± 0.006	0.56 ± 0.05	0.77 ± 0.06	0.61 ± 0.06
		L1	0.082 ± 0.014	0.088 ± 0.015	0.025 ± 0.004	0.34 ± 0.03	0.74 ± 0.06	0.74 ± 0.07
		L2	0.088 ± 0.013	0.080 ± 0.012	0.059 ± 0.009	0.54 ± 0.04	0.62 ± 0.04	0.56 ± 0.04
		L3	0.065 ± 0.012	0.048 ± 0.008	0.042 ± 0.008	0.51 ± 0.04	0.54 ± 0.04	0.49 ± 0.04
		S	0.559 ± 0.092	0.301 ± 0.049	0.180 ± 0.029	0.86 ± 0.06	0.67 ± 0.05	0.49 ± 0.03
		R	0.183 ± 0.026	0.131 ± 0.018	0.053 ± 0.007	0.35 ± 0.02	0.47 ± 0.02	0.30 ± 0.01
		D	0.006 ± 0.001	0.051 ± 0.009	0.099 ± 0.017	0.21 ± 0.02	0.50 ± 0.05	0.55 ± 0.05
IR64	Na^+	L0	0.007 ± 0.002	0.010 ± 0.002	0.010 ± 0.003	0.04 ± 0.01	0.23 ± 0.05	0.31 ± 0.08
		L1	0.007 ± 0.001	0.039 ± 0.008	0.018 ± 0.003	0.03 ± 0.01	0.33 ± 0.07	0.49 ± 0.11
		L2	0.006 ± 0.001	0.049 ± 0.011	0.034 ± 0.008	0.03 ± 0.01	0.37 ± 0.08	0.32 ± 0.07
		L3	0.006 ± 0.001	0.024 ± 0.005	0.061 ± 0.013	0.05 ± 0.01	0.27 ± 0.05	0.71 ± 0.14
		S	0.063 ± 0.008	0.342 ± 0.044	0.334 ± 0.042	0.10 ± 0.01	0.76 ± 0.06	0.90 ± 0.07
		R	0.197 ± 0.026	0.191 ± 0.025	0.137 ± 0.018	0.38 ± 0.02	0.68 ± 0.03	0.76 ± 0.03
		D	0.009 ± 0.001	0.223 ± 0.026	0.381 ± 0.044	0.30 ± 0.03	2.19 ± 0.20	2.16 ± 0.19
Jasmine 85	Cl^-	L0	0.035 ± 0.009	0.029 ± 0.007	0.047 ± 0.012	0.35 ± 0.04	0.48 ± 0.06	1.23 ± 0.15
		L1	0.073 ± 0.011	0.064 ± 0.010	0.114 ± 0.018	0.39 ± 0.05	0.61 ± 0.08	1.63 ± 0.21
		L2	0.047 ± 0.008	0.085 ± 0.014	0.109 ± 0.023	0.36 ± 0.04	0.84 ± 0.09	2.00 ± 0.29
		L3	0.040 ± 0.007	0.091 ± 0.016	0.106 ± 0.049	0.34 ± 0.04	1.05 ± 0.12	1.46 ± 0.44
		S	0.333 ± 0.044	0.517 ± 0.068	0.402 ± 0.053	0.55 ± 0.05	1.34 ± 0.12	2.05 ± 0.18
		R	0.232 ± 0.033	0.192 ± 0.028	0.096 ± 0.014	0.46 ± 0.03	0.67 ± 0.05	0.58 ± 0.04
		D	0.016 ± 0.002	0.260 ± 0.040	0.622 ± 0.095	0.99 ± 0.12	2.77 ± 0.34	2.85 ± 0.35

(Continues)

APPENDIX 5 (Continued)

Variety	Ion	Organ	Content (mmoL)			Concentration (mmol g^{-1})		
Jasmine 85	K^+	L0	0.055 ± 0.015	0.046 ± 0.013	0.036 ± 0.010	0.55 ± 0.04	0.76 ± 0.06	0.95 ± 0.08
		L1	0.089 ± 0.015	0.084 ± 0.014	0.077 ± 0.014	0.47 ± 0.04	0.81 ± 0.07	1.13 ± 0.10
		L2	0.064 ± 0.009	0.068 ± 0.010	0.062 ± 0.012	0.50 ± 0.03	0.68 ± 0.04	1.12 ± 0.09
		L3	0.050 ± 0.009	0.051 ± 0.009	0.067 ± 0.033	0.43 ± 0.04	0.58 ± 0.05	0.91 ± 0.20
		S	0.451 ± 0.074	0.364 ± 0.060	0.166 ± 0.027	0.74 ± 0.05	0.98 ± 0.07	0.85 ± 0.06
		R	0.163 ± 0.023	0.142 ± 0.020	0.040 ± 0.006	0.33 ± 0.02	0.49 ± 0.02	0.24 ± 0.01
		D	0.002 ± 0.000	0.049 ± 0.009	0.173 ± 0.031	0.14 ± 0.01	0.52 ± 0.05	0.79 ± 0.08
Jasmine 85	Na^+	L0	0.006 ± 0.002	0.008 ± 0.002	0.018 ± 0.004	0.06 ± 0.01	0.13 ± 0.03	0.47 ± 0.10
		L1	0.006 ± 0.001	0.016 ± 0.003	0.039 ± 0.008	0.03 ± 0.01	0.15 ± 0.03	0.56 ± 0.12
		L2	0.005 ± 0.001	0.025 ± 0.006	0.036 ± 0.011	0.04 ± 0.01	0.24 ± 0.05	0.65 ± 0.18
		L3	0.006 ± 0.001	0.029 ± 0.006	0.043 ± 0.024	0.05 ± 0.01	0.34 ± 0.07	0.59 ± 0.32
		S	0.065 ± 0.008	0.296 ± 0.038	0.265 ± 0.034	0.10 ± 0.01	0.77 ± 0.06	1.36 ± 0.11
		R	0.166 ± 0.022	0.213 ± 0.028	0.146 ± 0.019	0.33 ± 0.01	0.73 ± 0.03	0.89 ± 0.04
		D	0.007 ± 0.001	0.207 ± 0.024	0.443 ± 0.052	0.42 ± 0.04	2.19 ± 0.20	2.03 ± 0.18
Loc Troi 1	Cl^-	L0	0.016 ± 0.004	0.010 ± 0.002	0.016 ± 0.004	0.23 ± 0.03	0.62 ± 0.07	0.85 ± 0.11
		L1	0.029 ± 0.004	0.028 ± 0.004	0.042 ± 0.006	0.23 ± 0.03	0.46 ± 0.06	0.79 ± 0.10
		L2	0.020 ± 0.003	0.035 ± 0.006	0.054 ± 0.010	0.23 ± 0.03	0.55 ± 0.06	0.84 ± 0.10
		L3	0.016 ± 0.003	0.077 ± 0.013	0.147 ± 0.049	0.21 ± 0.02	1.53 ± 0.17	1.96 ± 0.42
		S	0.137 ± 0.018	0.247 ± 0.033	0.290 ± 0.038	0.34 ± 0.03	0.94 ± 0.08	1.50 ± 0.13
		R	0.122 ± 0.018	0.115 ± 0.017	0.101 ± 0.015	0.51 ± 0.04	0.88 ± 0.06	1.00 ± 0.07
		D	0.020 ± 0.003	0.332 ± 0.051	0.570 ± 0.087	1.32 ± 0.16	3.93 ± 0.48	3.64 ± 0.44
Loc Troi 1	K^+	L0	0.035 ± 0.010	0.010 ± 0.003	0.011 ± 0.003	0.49 ± 0.04	0.63 ± 0.05	0.58 ± 0.05
		L1	0.057 ± 0.010	0.038 ± 0.007	0.032 ± 0.006	0.46 ± 0.04	0.63 ± 0.06	0.62 ± 0.05
		L2	0.037 ± 0.005	0.029 ± 0.004	0.028 ± 0.005	0.43 ± 0.03	0.47 ± 0.03	0.44 ± 0.03
		L3	0.030 ± 0.005	0.022 ± 0.004	0.034 ± 0.012	0.38 ± 0.03	0.43 ± 0.04	0.44 ± 0.07
		S	0.297 ± 0.049	0.144 ± 0.024	0.080 ± 0.013	0.74 ± 0.05	0.56 ± 0.04	0.42 ± 0.03
		R	0.084 ± 0.012	0.067 ± 0.009	0.039 ± 0.005	0.35 ± 0.02	0.51 ± 0.02	0.38 ± 0.02
		D	0.004 ± 0.001	0.036 ± 0.006	0.081 ± 0.014	0.24 ± 0.02	0.42 ± 0.04	0.52 ± 0.05
Loc Troi 1	Na^+	L0	0.004 ± 0.001	0.006 ± 0.001	0.009 ± 0.002	0.05 ± 0.01	0.36 ± 0.08	0.47 ± 0.11
		L1	0.005 ± 0.001	0.012 ± 0.002	0.015 ± 0.003	0.04 ± 0.01	0.19 ± 0.04	0.29 ± 0.06
		L2	0.005 ± 0.001	0.013 ± 0.003	0.025 ± 0.007	0.06 ± 0.01	0.21 ± 0.04	0.40 ± 0.09
		L3	0.005 ± 0.001	0.044 ± 0.009	0.100 ± 0.040	0.06 ± 0.01	0.87 ± 0.17	1.32 ± 0.50
		S	0.036 ± 0.005	0.181 ± 0.023	0.216 ± 0.028	0.09 ± 0.01	0.69 ± 0.05	1.12 ± 0.09
		R	0.074 ± 0.010	0.079 ± 0.010	0.085 ± 0.011	0.31 ± 0.01	0.59 ± 0.03	0.82 ± 0.04
		D	0.009 ± 0.001	0.219 ± 0.025	0.417 ± 0.049	0.58 ± 0.05	2.57 ± 0.23	2.66 ± 0.24
Loc Troi 5	Cl^-	L0	0.050 ± 0.013	0.019 ± 0.005	0.074 ± 0.020	0.32 ± 0.04	0.52 ± 0.06	1.03 ± 0.13
		L1	0.080 ± 0.012	0.066 ± 0.010	0.100 ± 0.016	0.37 ± 0.05	0.65 ± 0.08	1.08 ± 0.14
		L2	0.054 ± 0.009	0.107 ± 0.017	0.106 ± 0.019	0.31 ± 0.04	1.05 ± 0.12	1.28 ± 0.16
		L3	0.032 ± 0.005	0.065 ± 0.012	0.048 ± 0.011	0.31 ± 0.03	1.11 ± 0.13	1.36 ± 0.21
		S	0.283 ± 0.037	0.431 ± 0.057	0.522 ± 0.072	0.49 ± 0.04	1.28 ± 0.11	1.82 ± 0.17
		R	0.193 ± 0.028	0.117 ± 0.017	0.128 ± 0.019	0.39 ± 0.03	0.57 ± 0.04	0.68 ± 0.05
		D	0.037 ± 0.006	0.294 ± 0.045	0.853 ± 0.139	0.84 ± 0.10	2.72 ± 0.33	2.90 ± 0.38

APPENDIX 5 (Continued)

Variety	Ion	Organ	Content (mmoL)			Concentration (mmoL g^{-1})		
Loc Troi 5	K^+	L0	0.097 ± 0.027	0.035 ± 0.010	0.063 ± 0.018	0.62 ± 0.05	0.96 ± 0.08	0.89 ± 0.08
		L1	0.128 ± 0.022	0.086 ± 0.015	0.079 ± 0.014	0.58 ± 0.05	0.85 ± 0.07	0.84 ± 0.08
		L2	0.094 ± 0.014	0.073 ± 0.011	0.055 ± 0.009	0.55 ± 0.04	0.73 ± 0.05	0.65 ± 0.05
		L3	0.054 ± 0.009	0.033 ± 0.006	0.015 ± 0.004	0.53 ± 0.04	0.56 ± 0.05	0.42 ± 0.05
		S	0.527 ± 0.086	0.262 ± 0.043	0.152 ± 0.026	0.92 ± 0.06	0.80 ± 0.05	0.53 ± 0.04
		R	0.187 ± 0.026	0.105 ± 0.015	0.067 ± 0.010	0.38 ± 0.02	0.51 ± 0.02	0.35 ± 0.02
		D	0.015 ± 0.003	0.064 ± 0.011	0.191 ± 0.036	0.34 ± 0.03	0.59 ± 0.06	0.65 ± 0.07
Loc Troi 5	Na^+	L0	0.007 ± 0.002	0.011 ± 0.003	0.039 ± 0.010	0.05 ± 0.01	0.29 ± 0.06	0.54 ± 0.12
		L1	0.011 ± 0.002	0.025 ± 0.005	0.058 ± 0.012	0.05 ± 0.01	0.24 ± 0.05	0.62 ± 0.13
		L2	0.007 ± 0.002	0.058 ± 0.013	0.059 ± 0.015	0.04 ± 0.01	0.56 ± 0.12	0.73 ± 0.17
		L3	0.006 ± 0.001	0.040 ± 0.009	0.037 ± 0.010	0.06 ± 0.01	0.69 ± 0.14	1.04 ± 0.28
		S	0.064 ± 0.008	0.374 ± 0.047	0.454 ± 0.061	0.11 ± 0.01	1.08 ± 0.09	1.58 ± 0.13
		R	0.169 ± 0.022	0.143 ± 0.019	0.137 ± 0.019	0.34 ± 0.01	0.68 ± 0.03	0.73 ± 0.03
		D	0.012 ± 0.001	0.235 ± 0.027	0.680 ± 0.084	0.26 ± 0.02	2.15 ± 0.19	2.30 ± 0.22
ML202	Cl^-	L0	0.068 ± 0.017	0.021 ± 0.006	0.017 ± 0.004	0.35 ± 0.04	0.49 ± 0.06	0.54 ± 0.07
		L1	0.092 ± 0.014	0.085 ± 0.013	0.088 ± 0.014	0.45 ± 0.06	0.76 ± 0.10	1.03 ± 0.13
		L2	0.069 ± 0.011	0.108 ± 0.017	0.132 ± 0.021	0.47 ± 0.05	0.98 ± 0.11	1.15 ± 0.13
		L3	0.050 ± 0.008	0.121 ± 0.020	0.136 ± 0.024	0.44 ± 0.05	1.37 ± 0.14	1.50 ± 0.17
		S	0.296 ± 0.039	0.459 ± 0.061	0.550 ± 0.073	0.51 ± 0.04	1.15 ± 0.10	1.12 ± 0.10
		R	0.270 ± 0.039	0.183 ± 0.026	0.155 ± 0.022	0.59 ± 0.04	0.74 ± 0.05	0.69 ± 0.05
		D	0.025 ± 0.004	0.342 ± 0.052	0.536 ± 0.082	0.86 ± 0.10	3.34 ± 0.41	2.88 ± 0.35
ML202	K^+	L0	0.118 ± 0.032	0.029 ± 0.008	0.020 ± 0.005	0.60 ± 0.05	0.67 ± 0.06	0.62 ± 0.05
		L1	0.125 ± 0.022	0.083 ± 0.014	0.061 ± 0.011	0.62 ± 0.05	0.75 ± 0.07	0.72 ± 0.06
		L2	0.077 ± 0.011	0.054 ± 0.008	0.056 ± 0.008	0.52 ± 0.04	0.49 ± 0.03	0.49 ± 0.03
		L3	0.053 ± 0.009	0.039 ± 0.007	0.035 ± 0.007	0.46 ± 0.04	0.44 ± 0.04	0.39 ± 0.03
		S	0.484 ± 0.080	0.239 ± 0.039	0.222 ± 0.037	0.85 ± 0.06	0.60 ± 0.04	0.47 ± 0.03
		R	0.164 ± 0.023	0.131 ± 0.018	0.081 ± 0.011	0.35 ± 0.02	0.54 ± 0.03	0.36 ± 0.02
		D	0.003 ± 0.001	0.047 ± 0.008	0.102 ± 0.018	0.10 ± 0.01	0.47 ± 0.05	0.55 ± 0.05
ML202	Na^+	L0	0.008 ± 0.002	0.013 ± 0.003	0.011 ± 0.003	0.04 ± 0.01	0.29 ± 0.07	0.33 ± 0.07
		L1	0.009 ± 0.002	0.042 ± 0.008	0.045 ± 0.009	0.05 ± 0.01	0.38 ± 0.07	0.53 ± 0.10
		L2	0.008 ± 0.002	0.065 ± 0.015	0.070 ± 0.016	0.05 ± 0.01	0.60 ± 0.12	0.61 ± 0.13
		L3	0.007 ± 0.001	0.070 ± 0.014	0.090 ± 0.019	0.06 ± 0.01	0.80 ± 0.15	0.99 ± 0.19
		S	0.074 ± 0.010	0.436 ± 0.055	0.508 ± 0.065	0.13 ± 0.01	1.09 ± 0.09	1.04 ± 0.08
		R	0.214 ± 0.028	0.195 ± 0.026	0.191 ± 0.025	0.47 ± 0.02	0.79 ± 0.03	0.86 ± 0.04
		D	0.009 ± 0.001	0.268 ± 0.031	0.451 ± 0.053	0.32 ± 0.03	2.63 ± 0.23	2.41 ± 0.22
OM18	Cl^-	L0	0.074 ± 0.020	0.033 ± 0.008	0.034 ± 0.010	0.35 ± 0.04	0.50 ± 0.06	1.39 ± 0.19
		L1	0.061 ± 0.010	0.076 ± 0.012	0.056 ± 0.009	0.23 ± 0.03	0.69 ± 0.09	0.94 ± 0.12
		L2	0.023 ± 0.004	0.130 ± 0.021	0.141 ± 0.023	0.15 ± 0.02	0.99 ± 0.11	1.08 ± 0.12
		L3	0.028 ± 0.005	0.086 ± 0.014	0.140 ± 0.023	0.18 ± 0.02	0.93 ± 0.10	1.41 ± 0.15
		S	0.176 ± 0.024	0.485 ± 0.064	0.521 ± 0.069	0.22 ± 0.02	1.06 ± 0.09	1.09 ± 0.10
		R	0.258 ± 0.039	0.174 ± 0.025	0.134 ± 0.019	0.43 ± 0.03	0.63 ± 0.04	0.67 ± 0.05
		D	0.026 ± 0.004	0.307 ± 0.047	0.383 ± 0.059	0.69 ± 0.09	3.01 ± 0.37	2.42 ± 0.29

(Continues)

APPENDIX 5 (Continued)

Variety	Ion	Organ	Content (mmoL)			Concentration (mmol g^{-1})		
OM18	K^+	L0	0.132 ± 0.038	0.060 ± 0.016	0.020 ± 0.006	0.62 ± 0.05	0.93 ± 0.08	0.79 ± 0.07
		L1	0.166 ± 0.030	0.095 ± 0.017	0.056 ± 0.010	0.65 ± 0.06	0.86 ± 0.07	0.90 ± 0.08
		L2	0.101 ± 0.016	0.101 ± 0.015	0.102 ± 0.015	0.65 ± 0.04	0.76 ± 0.05	0.76 ± 0.05
		L3	0.082 ± 0.015	0.063 ± 0.011	0.062 ± 0.011	0.53 ± 0.04	0.67 ± 0.05	0.62 ± 0.05
		S	0.699 ± 0.119	0.372 ± 0.061	0.297 ± 0.049	0.90 ± 0.06	0.82 ± 0.06	0.61 ± 0.04
		R	0.234 ± 0.034	0.148 ± 0.021	0.080 ± 0.011	0.39 ± 0.02	0.54 ± 0.03	0.40 ± 0.02
		D	0.010 ± 0.002	0.055 ± 0.010	0.106 ± 0.019	0.26 ± 0.03	0.54 ± 0.05	0.67 ± 0.07
OM18	Na^+	L0	0.010 ± 0.002	0.015 ± 0.004	0.009 ± 0.002	0.05 ± 0.01	0.24 ± 0.05	0.36 ± 0.09
		L1	0.010 ± 0.002	0.044 ± 0.008	0.023 ± 0.005	0.04 ± 0.01	0.40 ± 0.08	0.39 ± 0.08
		L2	0.005 ± 0.001	0.074 ± 0.017	0.065 ± 0.015	0.04 ± 0.01	0.57 ± 0.12	0.50 ± 0.10
		L3	0.006 ± 0.001	0.045 ± 0.009	0.080 ± 0.016	0.04 ± 0.01	0.48 ± 0.09	0.80 ± 0.15
		S	0.080 ± 0.011	0.438 ± 0.056	0.473 ± 0.060	0.10 ± 0.01	0.95 ± 0.07	0.99 ± 0.08
		R	0.260 ± 0.036	0.215 ± 0.029	0.173 ± 0.023	0.43 ± 0.02	0.77 ± 0.03	0.85 ± 0.04
		D	0.011 ± 0.001	0.270 ± 0.031	0.323 ± 0.038	0.29 ± 0.03	2.66 ± 0.24	2.04 ± 0.18
OM2517	Cl^-	L0	0.040 ± 0.011	0.033 ± 0.008	0.053 ± 0.013	0.28 ± 0.04	0.45 ± 0.05	0.87 ± 0.10
		L1	0.111 ± 0.018	0.103 ± 0.016	0.159 ± 0.025	0.42 ± 0.06	0.75 ± 0.09	1.48 ± 0.19
		L2	0.101 ± 0.017	0.105 ± 0.017	0.237 ± 0.038	0.47 ± 0.06	0.97 ± 0.11	1.71 ± 0.19
		L3	0.062 ± 0.011	0.118 ± 0.020	0.175 ± 0.035	0.42 ± 0.05	1.17 ± 0.12	1.67 ± 0.21
		S	0.351 ± 0.049	0.442 ± 0.058	0.640 ± 0.085	0.54 ± 0.05	1.21 ± 0.11	1.91 ± 0.17
		R	0.269 ± 0.041	0.156 ± 0.022	0.150 ± 0.022	0.44 ± 0.03	0.58 ± 0.04	0.71 ± 0.05
		D	0.029 ± 0.005	0.351 ± 0.054	0.842 ± 0.129	1.02 ± 0.13	2.99 ± 0.36	3.11 ± 0.38
OM2517	Na^+	L0	0.086 ± 0.025	0.064 ± 0.017	0.059 ± 0.016	0.61 ± 0.05	0.87 ± 0.07	0.96 ± 0.08
		L1	0.167 ± 0.030	0.126 ± 0.022	0.121 ± 0.021	0.64 ± 0.06	0.91 ± 0.08	1.07 ± 0.09
		L2	0.133 ± 0.021	0.097 ± 0.014	0.158 ± 0.023	0.63 ± 0.04	0.91 ± 0.06	1.15 ± 0.08
		L3	0.093 ± 0.017	0.084 ± 0.015	0.101 ± 0.021	0.63 ± 0.05	0.84 ± 0.07	0.98 ± 0.10
		S	0.641 ± 0.109	0.453 ± 0.074	0.328 ± 0.054	1.01 ± 0.07	1.24 ± 0.08	0.96 ± 0.07
		R	0.213 ± 0.031	0.144 ± 0.020	0.066 ± 0.009	0.34 ± 0.02	0.52 ± 0.03	0.30 ± 0.01
		D	0.004 ± 0.001	0.081 ± 0.014	0.245 ± 0.044	0.12 ± 0.01	0.70 ± 0.07	0.91 ± 0.09
OM2517	K^+	L0	0.003 ± 0.001	0.007 ± 0.002	0.019 ± 0.005	0.02 ± 0.01	0.10 ± 0.02	0.30 ± 0.07
		L1	0.007 ± 0.001	0.035 ± 0.007	0.042 ± 0.008	0.03 ± 0.01	0.25 ± 0.05	0.38 ± 0.07
		L2	0.005 ± 0.001	0.040 ± 0.009	0.099 ± 0.023	0.03 ± 0.01	0.37 ± 0.08	0.70 ± 0.15
		L3	0.006 ± 0.001	0.055 ± 0.011	0.087 ± 0.021	0.04 ± 0.01	0.55 ± 0.10	0.82 ± 0.18
		S	0.069 ± 0.009	0.285 ± 0.036	0.452 ± 0.058	0.11 ± 0.01	0.78 ± 0.06	1.39 ± 0.11
		R	0.244 ± 0.034	0.190 ± 0.025	0.193 ± 0.026	0.39 ± 0.02	0.70 ± 0.03	0.93 ± 0.04
		D	0.009 ± 0.001	0.254 ± 0.030	0.573 ± 0.067	0.30 ± 0.03	2.15 ± 0.19	2.15 ± 0.19
OM4218	Cl^-	L0	0.032 ± 0.008	0.029 ± 0.007	0.047 ± 0.012	0.33 ± 0.04	0.49 ± 0.06	0.61 ± 0.07
		L1	0.088 ± 0.013	0.112 ± 0.017	0.113 ± 0.017	0.42 ± 0.05	0.65 ± 0.08	0.86 ± 0.11
		L2	0.051 ± 0.008	0.120 ± 0.019	0.087 ± 0.015	0.37 ± 0.04	0.88 ± 0.10	0.88 ± 0.10
		L3	0.042 ± 0.007	0.075 ± 0.013	0.050 ± 0.011	0.38 ± 0.04	0.84 ± 0.09	1.30 ± 0.18
		S	0.294 ± 0.039	0.519 ± 0.070	0.443 ± 0.058	0.52 ± 0.04	1.06 ± 0.09	1.16 ± 0.10
		R	0.231 ± 0.033	0.277 ± 0.041	0.170 ± 0.025	0.51 ± 0.04	0.73 ± 0.05	0.78 ± 0.05
		D	0.024 ± 0.004	0.383 ± 0.059	0.543 ± 0.083	1.29 ± 0.16	3.25 ± 0.40	3.18 ± 0.39

APPENDIX 5 (Continued)

Variety	Ion	Organ	Content (mmoL)			Concentration (mmol g^{-1})		
OM4218	K^+	L0	0.054 ± 0.015	0.045 ± 0.012	0.055 ± 0.015	0.56 ± 0.05	0.78 ± 0.06	0.72 ± 0.06
		L1	0.130 ± 0.022	0.128 ± 0.022	0.087 ± 0.015	0.60 ± 0.05	0.75 ± 0.07	0.69 ± 0.06
		L2	0.077 ± 0.011	0.084 ± 0.013	0.053 ± 0.008	0.55 ± 0.04	0.61 ± 0.04	0.54 ± 0.04
		L3	0.050 ± 0.009	0.043 ± 0.008	0.017 ± 0.004	0.45 ± 0.04	0.49 ± 0.04	0.45 ± 0.05
		S	0.483 ± 0.079	0.365 ± 0.060	0.206 ± 0.034	0.85 ± 0.06	0.72 ± 0.05	0.52 ± 0.04
		R	0.194 ± 0.027	0.233 ± 0.033	0.089 ± 0.012	0.42 ± 0.02	0.62 ± 0.03	0.40 ± 0.02
		D	0.004 ± 0.001	0.069 ± 0.012	0.107 ± 0.019	0.20 ± 0.02	0.59 ± 0.06	0.62 ± 0.06
OM4218	Na^+	L0	0.007 ± 0.002	0.015 ± 0.004	0.023 ± 0.006	0.07 ± 0.02	0.24 ± 0.05	0.30 ± 0.07
		L1	0.014 ± 0.003	0.038 ± 0.007	0.051 ± 0.010	0.07 ± 0.01	0.22 ± 0.04	0.40 ± 0.08
		L2	0.008 ± 0.002	0.061 ± 0.014	0.045 ± 0.011	0.06 ± 0.01	0.46 ± 0.10	0.44 ± 0.10
		L3	0.009 ± 0.002	0.038 ± 0.008	0.037 ± 0.010	0.08 ± 0.01	0.43 ± 0.08	0.98 ± 0.24
		S	0.076 ± 0.010	0.479 ± 0.062	0.440 ± 0.056	0.13 ± 0.01	0.95 ± 0.07	1.11 ± 0.09
		R	0.153 ± 0.020	0.305 ± 0.041	0.204 ± 0.027	0.33 ± 0.01	0.81 ± 0.04	0.92 ± 0.04
		D	0.011 ± 0.001	0.334 ± 0.039	0.488 ± 0.057	0.57 ± 0.05	2.85 ± 0.26	2.84 ± 0.25
OM4900	Cl^-	L0	0.046 ± 0.012	0.029 ± 0.007	0.072 ± 0.018	0.30 ± 0.04	0.58 ± 0.07	1.29 ± 0.16
		L1	0.087 ± 0.014	0.130 ± 0.020	0.203 ± 0.031	0.41 ± 0.05	0.82 ± 0.10	1.82 ± 0.23
		L2	0.054 ± 0.009	0.125 ± 0.020	0.162 ± 0.029	0.44 ± 0.05	1.19 ± 0.13	2.01 ± 0.25
		L3	0.041 ± 0.007	0.076 ± 0.013	0.113 ± 0.052	0.53 ± 0.06	1.16 ± 0.13	1.70 ± 0.52
		S	0.234 ± 0.032	0.439 ± 0.058	0.451 ± 0.060	0.43 ± 0.04	1.09 ± 0.10	1.60 ± 0.14
		R	0.160 ± 0.024	0.153 ± 0.022	0.077 ± 0.011	0.39 ± 0.03	0.66 ± 0.04	0.63 ± 0.04
		D	0.025 ± 0.004	0.312 ± 0.048	0.619 ± 0.095	0.80 ± 0.10	3.01 ± 0.37	2.72 ± 0.33
OM4900	K^+	L0	0.082 ± 0.024	0.039 ± 0.011	0.052 ± 0.014	0.53 ± 0.05	0.78 ± 0.06	0.93 ± 0.08
		L1	0.107 ± 0.019	0.110 ± 0.019	0.110 ± 0.019	0.50 ± 0.05	0.72 ± 0.06	1.01 ± 0.09
		L2	0.064 ± 0.010	0.071 ± 0.010	0.077 ± 0.013	0.51 ± 0.04	0.67 ± 0.04	0.96 ± 0.07
		L3	0.034 ± 0.006	0.039 ± 0.007	0.047 ± 0.023	0.44 ± 0.04	0.59 ± 0.05	0.67 ± 0.15
		S	0.423 ± 0.072	0.280 ± 0.046	0.144 ± 0.024	0.76 ± 0.05	0.70 ± 0.05	0.51 ± 0.04
		R	0.158 ± 0.023	0.142 ± 0.020	0.049 ± 0.007	0.39 ± 0.02	0.62 ± 0.03	0.39 ± 0.02
		D	0.006 ± 0.001	0.057 ± 0.010	0.156 ± 0.028	0.18 ± 0.02	0.55 ± 0.05	0.69 ± 0.07
OM4900	Na^+	L0	0.004 ± 0.001	0.010 ± 0.002	0.035 ± 0.009	0.03 ± 0.01	0.20 ± 0.04	0.64 ± 0.14
		L1	0.006 ± 0.001	0.046 ± 0.009	0.102 ± 0.020	0.03 ± 0.01	0.30 ± 0.06	0.91 ± 0.18
		L2	0.005 ± 0.001	0.053 ± 0.012	0.081 ± 0.021	0.04 ± 0.01	0.50 ± 0.10	1.02 ± 0.24
		L3	0.005 ± 0.001	0.034 ± 0.007	0.062 ± 0.034	0.06 ± 0.01	0.52 ± 0.10	0.95 ± 0.51
		S	0.060 ± 0.008	0.339 ± 0.043	0.412 ± 0.052	0.11 ± 0.01	0.82 ± 0.06	1.45 ± 0.11
		R	0.144 ± 0.020	0.171 ± 0.023	0.115 ± 0.015	0.36 ± 0.02	0.73 ± 0.03	0.93 ± 0.04
		D	0.007 ± 0.001	0.250 ± 0.029	0.413 ± 0.048	0.24 ± 0.02	2.42 ± 0.22	1.82 ± 0.16
OM5451	Cl^-	L0	0.066 ± 0.017	0.033 ± 0.009	0.070 ± 0.018	0.32 ± 0.04	0.46 ± 0.06	0.80 ± 0.10
		L1	0.116 ± 0.018	0.119 ± 0.019	0.175 ± 0.027	0.45 ± 0.06	0.65 ± 0.08	1.19 ± 0.15
		L2	0.079 ± 0.013	0.157 ± 0.026	0.130 ± 0.021	0.49 ± 0.05	1.18 ± 0.14	1.49 ± 0.17
		L3	0.064 ± 0.011	0.072 ± 0.013	0.092 ± 0.020	0.49 ± 0.05	1.18 ± 0.13	1.40 ± 0.19
		S	0.397 ± 0.053	0.624 ± 0.086	0.684 ± 0.090	0.50 ± 0.04	1.30 ± 0.12	1.84 ± 0.16
		R	0.294 ± 0.043	0.331 ± 0.050	0.226 ± 0.033	0.43 ± 0.03	0.90 ± 0.07	0.97 ± 0.07
		D	1.001 ± 0.154	0.519 ± 0.084	0.043 ± 0.007	4.18 ± 0.51	4.28 ± 0.55	1.05 ± 0.13

(Continues)

APPENDIX 5 (Continued)

Variety	Ion	Organ	Content (mmoL)			Concentration (mmoL g^{-1})		
OM5451	K^+	L0	0.125 ± 0.034	0.061 ± 0.018	0.073 ± 0.020	0.62 ± 0.05	0.85 ± 0.07	0.84 ± 0.07
		L1	0.165 ± 0.029	0.153 ± 0.028	0.134 ± 0.023	0.63 ± 0.06	0.83 ± 0.08	0.93 ± 0.08
		L2	0.112 ± 0.017	0.102 ± 0.016	0.080 ± 0.012	0.69 ± 0.05	0.78 ± 0.05	0.91 ± 0.06
		L3	0.081 ± 0.014	0.046 ± 0.009	0.050 ± 0.011	0.63 ± 0.05	0.76 ± 0.07	0.77 ± 0.08
		S	0.717 ± 0.118	0.455 ± 0.078	0.254 ± 0.042	0.89 ± 0.06	0.96 ± 0.07	0.69 ± 0.05
		R	0.312 ± 0.044	0.277 ± 0.040	0.112 ± 0.016	0.45 ± 0.02	0.75 ± 0.04	0.49 ± 0.02
		D	0.184 ± 0.033	0.081 ± 0.015	0.011 ± 0.002	0.77 ± 0.08	0.67 ± 0.07	0.27 ± 0.03
OM5451	Na^+	L0	0.007 ± 0.002	0.014 ± 0.003	0.035 ± 0.008	0.03 ± 0.01	0.19 ± 0.04	0.39 ± 0.09
		L1	0.013 ± 0.002	0.049 ± 0.010	0.075 ± 0.014	0.05 ± 0.01	0.27 ± 0.06	0.52 ± 0.10
		L2	0.008 ± 0.002	0.083 ± 0.020	0.056 ± 0.013	0.05 ± 0.01	0.61 ± 0.13	0.65 ± 0.14
		L3	0.007 ± 0.001	0.040 ± 0.008	0.036 ± 0.009	0.05 ± 0.01	0.66 ± 0.13	0.55 ± 0.13
		S	0.109 ± 0.014	0.451 ± 0.060	0.530 ± 0.068	0.14 ± 0.01	0.96 ± 0.08	1.43 ± 0.11
		R	0.285 ± 0.038	0.305 ± 0.042	0.246 ± 0.032	0.42 ± 0.02	0.83 ± 0.04	1.05 ± 0.04
		D	0.627 ± 0.073	0.340 ± 0.042	0.014 ± 0.002	2.62 ± 0.23	2.81 ± 0.27	0.34 ± 0.03
OM576	Cl^-	L0	0.056 ± 0.014	0.034 ± 0.009	0.036 ± 0.010	0.31 ± 0.04	0.56 ± 0.07	0.96 ± 0.12
		L1	0.082 ± 0.013	0.076 ± 0.012	0.111 ± 0.018	0.37 ± 0.05	0.85 ± 0.11	1.31 ± 0.17
		L2	0.056 ± 0.009	0.099 ± 0.016	0.131 ± 0.024	0.39 ± 0.04	1.15 ± 0.13	1.77 ± 0.22
		L3	0.042 ± 0.007	0.119 ± 0.021	0.156 ± 0.043	0.39 ± 0.04	1.63 ± 0.18	2.12 ± 0.37
		S	0.302 ± 0.040	0.415 ± 0.055	0.591 ± 0.083	0.46 ± 0.04	1.40 ± 0.12	1.88 ± 0.17
		R	0.286 ± 0.041	0.121 ± 0.018	0.121 ± 0.018	0.54 ± 0.04	0.66 ± 0.05	0.70 ± 0.05
		D	0.027 ± 0.004	0.295 ± 0.045	0.952 ± 0.155	1.01 ± 0.12	3.01 ± 0.37	3.25 ± 0.42
OM576	K^+	L0	0.099 ± 0.027	0.045 ± 0.012	0.032 ± 0.009	0.55 ± 0.04	0.73 ± 0.06	0.85 ± 0.07
		L1	0.114 ± 0.020	0.076 ± 0.013	0.086 ± 0.016	0.50 ± 0.04	0.84 ± 0.07	1.00 ± 0.09
		L2	0.076 ± 0.011	0.051 ± 0.008	0.068 ± 0.011	0.51 ± 0.03	0.59 ± 0.04	0.92 ± 0.07
		L3	0.041 ± 0.007	0.050 ± 0.009	0.064 ± 0.018	0.38 ± 0.03	0.69 ± 0.06	0.87 ± 0.12
		S	0.508 ± 0.084	0.239 ± 0.039	0.206 ± 0.035	0.79 ± 0.05	0.81 ± 0.06	0.66 ± 0.05
		R	0.175 ± 0.025	0.087 ± 0.012	0.051 ± 0.008	0.33 ± 0.02	0.47 ± 0.02	0.30 ± 0.01
		D	0.003 ± 0.001	0.054 ± 0.010	0.219 ± 0.041	0.11 ± 0.01	0.56 ± 0.06	0.76 ± 0.08
OM576	Na^+	L0	0.006 ± 0.001	0.012 ± 0.003	0.018 ± 0.004	0.03 ± 0.01	0.20 ± 0.04	0.47 ± 0.11
		L1	0.006 ± 0.001	0.026 ± 0.005	0.045 ± 0.009	0.03 ± 0.01	0.28 ± 0.06	0.51 ± 0.10
		L2	0.005 ± 0.001	0.030 ± 0.007	0.055 ± 0.014	0.03 ± 0.01	0.35 ± 0.07	0.74 ± 0.17
		L3	0.004 ± 0.001	0.061 ± 0.013	0.077 ± 0.025	0.03 ± 0.01	0.82 ± 0.16	1.03 ± 0.32
		S	0.051 ± 0.007	0.268 ± 0.034	0.415 ± 0.056	0.08 ± 0.01	0.94 ± 0.07	1.36 ± 0.11
		R	0.198 ± 0.026	0.124 ± 0.016	0.142 ± 0.020	0.38 ± 0.02	0.69 ± 0.03	0.85 ± 0.04
		D	0.008 ± 0.001	0.212 ± 0.025	0.587 ± 0.072	0.31 ± 0.03	2.17 ± 0.20	2.03 ± 0.19
OM6976	Cl^-	L0	0.034 ± 0.009	0.010 ± 0.003	0.023 ± 0.006	0.29 ± 0.04	0.38 ± 0.05	0.70 ± 0.09
		L1	0.064 ± 0.010	0.070 ± 0.011	0.081 ± 0.013	0.39 ± 0.05	0.63 ± 0.08	0.90 ± 0.12
		L2	0.041 ± 0.007	0.083 ± 0.014	0.131 ± 0.021	0.38 ± 0.04	0.95 ± 0.11	1.14 ± 0.13
		L3	0.031 ± 0.005	0.064 ± 0.011	0.128 ± 0.026	0.38 ± 0.04	1.07 ± 0.12	1.47 ± 0.19
		S	0.252 ± 0.034	0.382 ± 0.054	0.509 ± 0.068	0.54 ± 0.05	1.05 ± 0.10	1.40 ± 0.12
		R	0.196 ± 0.028	0.172 ± 0.027	0.138 ± 0.020	0.53 ± 0.04	0.78 ± 0.06	0.84 ± 0.06
		D	0.023 ± 0.003	0.211 ± 0.034	0.603 ± 0.092	1.02 ± 0.12	2.92 ± 0.38	3.22 ± 0.39

APPENDIX 5 (Continued)

Variety	Ion	Organ	Content (mmoL)			Concentration (mmol g^{-1})		
OM6976	K^+	L0	0.073 ± 0.020	0.017 ± 0.005	0.022 ± 0.006	0.60 ± 0.05	0.64 ± 0.06	0.69 ± 0.06
		L1	0.102 ± 0.018	0.091 ± 0.017	0.070 ± 0.013	0.64 ± 0.06	0.78 ± 0.07	0.76 ± 0.07
		L2	0.070 ± 0.010	0.061 ± 0.010	0.071 ± 0.010	0.64 ± 0.04	0.70 ± 0.05	0.61 ± 0.04
		L3	0.045 ± 0.008	0.035 ± 0.007	0.049 ± 0.010	0.56 ± 0.05	0.59 ± 0.05	0.56 ± 0.06
		S	0.418 ± 0.069	0.272 ± 0.047	0.201 ± 0.033	0.91 ± 0.06	0.74 ± 0.05	0.54 ± 0.04
		R	0.117 ± 0.016	0.117 ± 0.017	0.052 ± 0.007	0.33 ± 0.02	0.52 ± 0.03	0.32 ± 0.01
		D	0.005 ± 0.001	0.033 ± 0.006	0.102 ± 0.018	0.24 ± 0.02	0.46 ± 0.05	0.55 ± 0.06
OM6976	Na^+	L0	0.006 ± 0.002	0.008 ± 0.002	0.016 ± 0.004	0.05 ± 0.01	0.33 ± 0.07	0.49 ± 0.11
		L1	0.007 ± 0.001	0.022 ± 0.005	0.033 ± 0.007	0.05 ± 0.01	0.20 ± 0.04	0.37 ± 0.07
		L2	0.005 ± 0.001	0.034 ± 0.008	0.054 ± 0.012	0.04 ± 0.01	0.39 ± 0.09	0.48 ± 0.10
		L3	0.007 ± 0.001	0.030 ± 0.006	0.068 ± 0.016	0.08 ± 0.01	0.49 ± 0.10	0.76 ± 0.17
		S	0.051 ± 0.007	0.297 ± 0.040	0.398 ± 0.051	0.11 ± 0.01	0.82 ± 0.07	1.15 ± 0.09
		R	0.146 ± 0.020	0.149 ± 0.021	0.136 ± 0.018	0.40 ± 0.02	0.68 ± 0.03	0.85 ± 0.04
		D	0.009 ± 0.001	0.161 ± 0.020	0.451 ± 0.053	0.41 ± 0.04	2.21 ± 0.21	2.44 ± 0.22
OM7347	Cl^-	L0	0.032 ± 0.008	0.017 ± 0.004	0.061 ± 0.016	0.39 ± 0.05	0.65 ± 0.08	1.32 ± 0.16
		L1	0.059 ± 0.009	0.052 ± 0.008	0.160 ± 0.025	0.46 ± 0.06	0.78 ± 0.10	1.89 ± 0.24
		L2	0.040 ± 0.006	0.059 ± 0.009	0.132 ± 0.031	0.45 ± 0.05	1.00 ± 0.11	1.42 ± 0.23
		L3	0.027 ± 0.005	0.089 ± 0.016	0.062 ± 0.015	0.43 ± 0.05	1.28 ± 0.15	2.20 ± 0.34
		S	0.182 ± 0.025	0.293 ± 0.039	0.442 ± 0.059	0.56 ± 0.05	1.56 ± 0.14	2.95 ± 0.26
		R	0.145 ± 0.021	0.119 ± 0.017	0.059 ± 0.009	0.49 ± 0.03	0.79 ± 0.05	0.56 ± 0.04
		D	0.022 ± 0.003	0.370 ± 0.057	0.502 ± 0.077	1.00 ± 0.12	3.66 ± 0.45	2.71 ± 0.33
OM7347	K^+	L0	0.050 ± 0.014	0.017 ± 0.005	0.027 ± 0.007	0.61 ± 0.05	0.62 ± 0.05	0.57 ± 0.05
		L1	0.073 ± 0.013	0.045 ± 0.008	0.056 ± 0.010	0.58 ± 0.05	0.66 ± 0.06	0.66 ± 0.06
		L2	0.044 ± 0.006	0.030 ± 0.005	0.060 ± 0.013	0.52 ± 0.03	0.52 ± 0.03	0.64 ± 0.06
		L3	0.029 ± 0.005	0.034 ± 0.007	0.012 ± 0.003	0.47 ± 0.04	0.49 ± 0.04	0.43 ± 0.05
		S	0.276 ± 0.047	0.112 ± 0.018	0.037 ± 0.006	0.84 ± 0.06	0.58 ± 0.04	0.24 ± 0.02
		R	0.088 ± 0.012	0.082 ± 0.011	0.035 ± 0.005	0.31 ± 0.01	0.53 ± 0.03	0.33 ± 0.02
		D	0.005 ± 0.001	0.041 ± 0.007	0.102 ± 0.018	0.21 ± 0.02	0.41 ± 0.04	0.55 ± 0.05
OM7347	Na^+	L0	0.005 ± 0.001	0.007 ± 0.002	0.051 ± 0.012	0.06 ± 0.01	0.28 ± 0.06	1.12 ± 0.25
		L1	0.005 ± 0.001	0.019 ± 0.004	0.119 ± 0.023	0.04 ± 0.01	0.27 ± 0.05	1.41 ± 0.28
		L2	0.004 ± 0.001	0.024 ± 0.006	0.114 ± 0.038	0.05 ± 0.01	0.42 ± 0.09	1.24 ± 0.37
		L3	0.004 ± 0.001	0.052 ± 0.011	0.040 ± 0.011	0.07 ± 0.01	0.73 ± 0.15	1.41 ± 0.38
		S	0.041 ± 0.006	0.175 ± 0.022	0.311 ± 0.040	0.12 ± 0.01	0.95 ± 0.07	2.04 ± 0.16
		R	0.111 ± 0.015	0.091 ± 0.012	0.087 ± 0.012	0.38 ± 0.02	0.60 ± 0.03	0.82 ± 0.04
		D	0.006 ± 0.001	0.266 ± 0.031	0.474 ± 0.055	0.29 ± 0.03	2.64 ± 0.24	2.55 ± 0.23
ST24	Cl^-	L0	0.029 ± 0.007	0.016 ± 0.004	0.033 ± 0.008	0.36 ± 0.04	0.72 ± 0.09	1.29 ± 0.16
		L1	0.048 ± 0.007	0.055 ± 0.008	0.102 ± 0.016	0.31 ± 0.04	0.66 ± 0.08	1.34 ± 0.17
		L2	0.031 ± 0.005	0.061 ± 0.010	0.091 ± 0.015	0.33 ± 0.04	0.76 ± 0.08	1.16 ± 0.14
		L3	0.033 ± 0.006	0.074 ± 0.012	0.081 ± 0.020	0.36 ± 0.04	1.14 ± 0.12	1.24 ± 0.19
		S	0.205 ± 0.027	0.335 ± 0.045	0.374 ± 0.049	0.45 ± 0.04	0.99 ± 0.09	1.32 ± 0.12
		R	0.186 ± 0.027	0.182 ± 0.026	0.129 ± 0.019	0.49 ± 0.03	0.84 ± 0.06	0.85 ± 0.06
		D	0.028 ± 0.004	0.216 ± 0.033	0.487 ± 0.075	1.20 ± 0.15	2.95 ± 0.36	2.95 ± 0.36

(Continues)

APPENDIX 5 (Continued)

Variety	Ion	Organ	Content (mmoL)			Concentration (mmol g^{-1})		
ST24	K^+	L0	0.039 ±0.011	0.017 ±0.005	0.018 ±0.005	0.48 ±0.04	0.82 ±0.07	0.69 ±0.06
		L1	0.071 ±0.012	0.062 ±0.011	0.056 ±0.010	0.47 ±0.04	0.74 ±0.06	0.76 ±0.07
		L2	0.045 ±0.007	0.045 ±0.007	0.052 ±0.008	0.50 ±0.03	0.56 ±0.04	0.67 ±0.05
		L3	0.046 ±0.008	0.031 ±0.006	0.037 ±0.010	0.50 ±0.04	0.47 ±0.04	0.56 ±0.07
		S	0.317 ±0.052	0.210 ±0.035	0.136 ±0.022	0.69 ±0.05	0.62 ±0.04	0.49 ±0.03
		R	0.166 ±0.023	0.135 ±0.019	0.063 ±0.009	0.43 ±0.02	0.63 ±0.03	0.42 ±0.02
		D	0.007 ±0.001	0.038 ±0.007	0.105 ±0.019	0.32 ±0.03	0.52 ±0.05	0.64 ±0.06
ST24	Na^+	L0	0.001 ±0.000	0.002 ±0.000	0.009 ±0.002	0.01 ±0.00	0.08 ±0.02	0.36 ±0.08
		L1	0.001 ±0.000	0.012 ±0.002	0.042 ±0.008	0.01 ±0.00	0.14 ±0.03	0.57 ±0.11
		L2	0.001 ±0.000	0.022 ±0.005	0.044 ±0.011	0.01 ±0.00	0.28 ±0.06	0.56 ±0.12
		L3	0.000 ±0.000	0.049 ±0.010	0.054 ±0.015	0.01 ±0.00	0.76 ±0.14	0.83 ±0.23
		S	0.029 ±0.004	0.256 ±0.033	0.325 ±0.041	0.06 ±0.01	0.74 ±0.06	1.12 ±0.09
		R	0.140 ±0.019	0.176 ±0.023	0.150 ±0.020	0.36 ±0.01	0.80 ±0.03	0.97 ±0.04
		D	0.008 ±0.001	0.175 ±0.020	0.449 ±0.052	0.36 ±0.03	2.38 ±0.21	2.70 ±0.24

Note: L0 = youngest leaf without a ligule, L1 = the youngest fully developed leaf blade, L2 = second fully developed leaf blade from the top, L3 = third fully developed leaf blade from the top, S = sheaths, R = roots, D = dead leaves. 0, 50, and 100 refer to the concentration (mM) of the NaCl treatments. "±" indicates standard error.

APPENDIX 6

Mean SPAD, PRI and SES by variety and NaCl treatment.

	SPAD			PRI			Score		
Variety	0	50	100	0	50	100	0	50	100
BTE1	38.3 ±1.1	36.3 ±1.1	39.3 ±1.2	119.1 ±8.5	94.6 ±6.8	125.5 ±9.0	1.0 ±0.1	2.7 ±0.3	3.1 ±0.4
Dai Thom 8	38.6 ±1.2	41.4 ±1.2	40.6 ±1.3	119.0 ±8.5	111.6 ±8.0	129.3 ±9.7	1.0 ±0.1	2.7 ±0.3	3.5 ±0.5
DS1	39.8 ±1.2	38.4 ±1.1	40.7 ±1.2	115.5 ±8.3	105.4 ±7.6	106.5 ±7.6	1.0 ±0.1	2.1 ±0.3	3.6 ±0.5
GKG 29	39.8 ±1.2	39.0 ±1.2	38.3 ±1.1	109.5 ±7.9	109.9 ±8.2	113.2 ±8.1	1.0 ±0.1	1.5 ±0.2	2.2 ±0.3
GKG 35	33.9 ±1.0	35.0 ±1.0	29.8 ±0.9	112.0 ±8.0	117.0 ±8.4	104.7 ±7.5	1.0 ±0.1	1.3 ±0.2	4.4 ±0.6
GKG 9	40.9 ±1.2	41.3 ±1.3	40.9 ±1.2	117.7 ±8.4	102.2 ±7.6	124.1 ±8.9	1.0 ±0.1	2.3 ±0.3	2.8 ±0.4
IR64	39.8 ±1.2	39.2 ±1.2	39.0 ±1.2	115.7 ±8.3	114.4 ±8.2	124.3 ±8.9	1.0 ±0.1	2.4 ±0.3	4.1 ±0.5
Jasmine 85	40.6 ±1.2	41.9 ±1.2	36.2 ±1.1	107.3 ±7.7	116.9 ±8.4	112.7 ±8.1	1.0 ±0.1	2.7 ±0.3	4.8 ±0.6
Loc Troi 1	40.1 ±1.2	36.4 ±1.1	33.1 ±1.0	109.9 ±7.9	85.7 ±6.1	116.0 ±8.3	1.0 ±0.1	2.1 ±0.3	3.8 ±0.5
Loc Troi 5	36.7 ±1.1	36.6 ±1.1	37.1 ±1.2	115.2 ±8.3	112.1 ±8.0	117.0 ±8.8	1.0 ±0.1	2.4 ±0.3	3.1 ±0.4
ML202	36.9 ±1.1	38.4 ±1.1	39.7 ±1.2	105.6 ±7.6	105.9 ±7.6	110.8 ±7.9	1.0 ±0.1	2.1 ±0.3	3.3 ±0.4
OM18	40.4 ±1.3	38.8 ±1.2	41.8 ±1.2	122.0 ±9.1	113.7 ±8.2	127.0 ±9.1	1.0 ±0.1	3.0 ±0.4	3.6 ±0.5
OM2517	39.3 ±1.2	35.9 ±1.1	38.9 ±1.2	104.9 ±7.9	107.7 ±7.7	115.2 ±8.3	1.0 ±0.1	2.4 ±0.3	3.4 ±0.4
OM4218	42.1 ±1.2	42.0 ±1.2	39.6 ±1.2	108.8 ±7.8	109.7 ±7.9	113.3 ±8.1	1.0 ±0.1	1.0 ±0.1	2.3 ±0.3
OM4900	36.0 ±1.1	36.0 ±1.1	35.2 ±1.0	110.8 ±8.3	102.8 ±7.4	118.5 ±8.5	1.0 ±0.1	1.6 ±0.2	4.4 ±0.6
OM5451	36.6 ±1.1	39.7 ±1.2	37.4 ±1.1	110.8 ±8.0	118.0 ±8.8	119.0 ±8.5	1.0 ±0.1	1.3 ±0.2	2.3 ±0.3
OM576	40.2 ±1.2	35.6 ±1.1	39.0 ±1.2	116.2 ±8.3	82.3 ±5.9	116.2 ±8.7	1.0 ±0.1	3.0 ±0.4	4.4 ±0.6
OM6976	39.4 ±1.2	38.0 ±1.2	39.6 ±1.2	114.4 ±8.2	104.0 ±7.8	127.4 ±9.1	1.0 ±0.1	3.0 ±0.4	3.7 ±0.5
OM7347	37.0 ±1.1	36.2 ±1.1	34.8 ±1.0	120.0 ±8.6	118.9 ±8.5	110.6 ±7.9	1.0 ±0.1	1.6 ±0.2	4.6 ±0.6
ST24	38.5 ±1.1	37.4 ±1.1	35.9 ±1.1	108.0 ±7.8	113.0 ±8.1	113.5 ±8.1	1.0 ±0.1	2.1 ±0.3	4.1 ±0.5

Note: 0, 50, 100 refer to the concentration (mM) of the NaCl treatments. "±" indicates standard error.