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Studies on Salt Tolerance in Korean Rice Cultivars : II. Effects of NaCl treatment on sodium and potassium ions concentration in leaf blade, leaf sheath and root of rice plants

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Abstract:
The mechanism of cultivar difference in salt tolerance was investigated with Korean rice cultivars, paying special attention to the relationship between sodium (Na) and potassium (K) ions in various organs. Three tolerant and three sensitive cultivars, with Nipponbare and IR8 as the reference cultivars, were cultured in solutions containing different concentrations of NaCl. The Na ion concentration in the leaf blade, leaf sheath and root increased with increasing NaCl in the culture solution in all cultivars. Furthermore, with increasing Na ion, the K ion concentration decreased in the root and leaf sheath. Conversely, in the leaf blade, the K ion concentration increased with increasing Na ion. No relationship between thc extent of accumulation of Na and K ion in the leaf blade and salt tolerance was observed, hence, these findings do not support the hypothesis that salt tolerance is related with the exclusion of K ion by absorbed Na ion in the leaf blade. However, exclusion of K ion by Na ion in the root was round in all the cultivars tested, and extent of the K exclusion might be related to the salt tolerance in rice plants.

Keywords:
Cultivar difference, Oryza sativa L., Potassium concentration, Rice, Salt tolerance, Sodium concentration

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