ABSTRACT

In this study, *Oryza sativa* L. cv. Super 2000 was exposed to different concentrations of Sodium (15, 30, 45 and 60 mM) and Lithium (1, 2, 3 and 4 ppm). The growth parameters i.e. plant height, number of leaves, fresh and dry weight, physiological parameters such as rate of photosynthesis (A), rate of transpiration (E), stomatal conductance (g_s) and chlorophyll content, Sodium, Lithium and Potassium uptake in above and ground parts of *Oryza sativa* L. cv . Super 2000 were determined. Plant height and number of leaves were measured from Ist week of August till the end of November, 2022. The plant height, number of leaves, fresh and dry weight was non-significantly reduced with increasing concentrations of Sodium and Lithium. Total grain production and grain weight of *Oryza sativa* L. cv. Super 2000 were significantly decreased with increase in concentrations of Sodium and Lithium .With the increasing Sodium and Lithium concentrations, chlorophyll content was significant increased but photosynthesis rate, transpiration rate and stomatal conductance were increased at low concentration (T_1, T_2) but decreased significantly at higher concentrations (T_3, T_4) of Sodium and Lithium. Flame photometer results indicated that root, shoot and leaves level Sodium and Lithium uptake was increased but grain level sodium uptake was non-significantly reduced with increasing concentration of treatments, Lithium uptake was not detected in grains. Potassium uptake was decreased with increasing concentrations of Sodium and Lithium. This study concludes that studied parameter of *Oryza sativa* L. cv. Super 2000 can tolerate the Sodium (15, 30, 45 and 60 mM) Lithium concentrations (1, 2, 3, 4 ppm) at root, shoot and leaves level, both Sodium and Lithium were not transported in grains as most of Sodium and Lithium were localized in shoot and leaves. This study can help to cultivate rice (*Oryza sativa* L. cv. Super 2000) in the soil varying concentrations levels of Sodium chloride and Lithium chloride.