ABSTRACT

Plant growth promoting potential of bacterial inoculates (*Halomonas elongata*) on rice plant was evaluated in this study under 0 or 100 mM NaCl stress was studied. The bacteria were isolated from the Salt Range of Pakistan and identified by 16S rRNA sequence. Two varieties of rice namely Basmati 515 (fine grain) and KSK 133 (corse quality) were used. The experimentation was done in wire net house conditions at Botanic Garden GCU, Lahore. The setup was outlaid according to Completely Randomized Design (CRD) with triple replicates. Seeds were treated with bacteria grown conventionally under gnotobiotic conditions. Inoculation was done as seed treatment. Seeds were then sown for preparatory phase and then transplanted to the experimental pots after 25 days. NaCl stress was applied to transplanted plants when they were 10 days old (after transplantation) and stable enough to survive the stress. Pots were irrigated with 0 or 100 mM NaCl till EC was uniform. Plants were harvested fifteen days after application of stress. Second and third harvests were noted with the gap of ten days.

Evaluations of parameters involving number of leaves and tillers, height of plant, length of root and shoot, fresh weight of shoot, root and plant biomass was done. Photosynthetic parameters including rate of assimilation, rate of transpiration, stomatal conductance, sub-stomatal CO_2 conductance and water use efficiency were recorded. Relative water contents were also evaluated.

Bacterial influence positively affected the plant growth. The recoded observation revealed that the parameters of plants recorded under NaCl stress without bacterial inoculation showed least growth. As the bacteria was extremely halophilic, its influence on plants under NaCl stress proved to be highly efficient in elleviating negative effects of salinity.