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1. Aslam, M., R.H. Qureshi and N. Ahmed. 1993. A rapid screening for salt tolerance in rice. *plant and soil*. 15: 99-107.
2. Haghnia, G. 1989. manual of plant tolerate to salinity stress. University jahad mashhad. p. 31-32.
3. Heidari sharifabad, H. 2001. plant and salinity .labratuar of plant and teff. p. 188-189.
4. Hoseini, A. and D. Molazem. 2001. Evaluating of using salinity stress in germination stage on different rice genotypes. 7th Iranian crop science congress. p. 561-562.
5. Khosh kholgh sima, N. and H. Asgari. 1997. Evaluating of physiological methodsresponse plant to salinity stress. 6th Iranian crop science congress. p. 35-75.
6. Kumar, R.G., K. Shah and R.S. Dubey. 2000. Salinity induced behavioral changes in malate dehydrogenase and glutamate behavioral changes in malate dehydrogenase activities in rice seedling of differing salt tolerance *plant science*. 156: 23-34.
7. Marliyn, C.B. and G. Difarquhar. 1984. Photosynthesis and stomatal response of two Mangrove species. *Aeqiceras coniculatum* and *Avicennia Marina* , to Long term salinity and humidity conditions. *plant physiol*. 74: 1-6.
8. Rhoades, J.D. and A.M. Kandish. 1992. The use of saline waters for crop production. *Irrigation and Drainage paper*. 48. FAO. Rome.
9. Shannon M.C. and C.M. Grieue. 1998. Tolerance vegetable crop To salinity. *scientia Hort.*, 78: 5-8.
10. Tun, N., B. Heligtay, A. Kleeberg and C. Ricard. 1998. Salt tolerance of rice (*Oriza sativa* L.) varieties from Myanmar. *Curentscience* 54: 584-598.
11. Veinberg, R.H., R. lenner and A. Poljakaff-mayber. 1984. changes in growth and water soluble solute concentration in sorghum bicolor stressed with sodium and potassium salts. *plant phisiol*. 62: 472-480.
12. Warvich, K.A., S.I. Khan and A.D. Bradshaw. 1992. Potential for evaluation heavy metal tolerance in plant S.I: Copper and zinc tolerance in *Agrostis tenuis*. *Heridity*. 32: 309-311.
13. Yeo, A.K. and T.J. Flowers. 1984. Salinity resistance in rice (*Oryza sativa* L.) and a pyramiding approach to breeding varieties for saline soils. *Aus. J. of plant Physiol*. 13: 161-173.
14. Yoshida, S., D.A. Forno, J.H. Cock and K.A. Gomez. 1976. Routine procedures for growing rice plants in culture solution. P: 61-66. in laboratory manual for physiological studies of rice. International Rice research Institute, Losbanos, Lagona Philippines.
15. Zeng, L. and M.C. Shannon. 2000. Salinity effect on growth and yield Component of rice science. 40: 996-1003.

Evaluation of the Using of Rice Genotypes Response to Salinity Stress at Seedling Stage in Hydroponic Culture

M. Mohammadzadeh¹, S.A. Peighambari², A.R. Nabipoor³ and M. Norouzi⁴

Abstract

In order to evaluate the interaction of rice genotypes to salinity stress, responses of 16 rice genotypes were assessed to 4 salinity levels (0, 4, 8, 12, dS/m) through a split plot experiment seedling stage in hydroponic culture. In this experiment characters such as plant height, leaf area, root length stem length, dry weight of root and stem, dry weight of leaf and total biomass were measured. All the characters in reaction to salinity showed significant. And correlation coefficient of seedling stage had all the characters positive and significant differences. At seedling stage, total biomass proved to be the trait of choice for assessing the tolerance among cultivars as well as treatments. Total biomass of the PSBRC88 variety was decreased about 42% compared to control. Whereas this decrease for Shafagh was 26%. Also Nemat A/19R had the most decrease compared to control (81%). The decrease of stem dry weight of PSBRC88 variety at 12 dS/m salt level was less than other varieties with comparison to control (about 23%). The most decrease in stem dry weight of was for IR60819R/IR58025A by 86% relative to control. The decrease of leaf area in Gerdeh variety was less than other varieties with comparison to control (about 61%).

Keywords: Rice, Hydroponic culture, Salt tolerance, Seedling, Total Biomass, Coefficient correlation

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