SCREENING OF RICE VARIETIES (*Oryza sativa*) FOR DROUGHT TOLERENCE USING POLYETHYLENE GLYCOL (PEG 800)

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ASBTRACT

SCREENING OF RICE VARIETIES (*Oryza sativa* L.) FOR DROUGHT TOLERANCE USING POLYETHYLENE GLYCOL (PEG 8000)

Water is important in agricultural field because it is used to grow fresh product. Drought stress severely impairs rice production and yield stability of crops. With diminishing water supplies for agriculture worldwide, the needs to improve drought adaptation of rice and to screen resistant varieties are becoming increasingly important. Therefore the aim of the present study was to screen and identify modern rice genotypes under drought stress by using polyethylene glycol (PEG) and to determine the optimum (PEG) concentration to induce plant-water deficit stress in an aerated hydroponic system. A total of seventeen genotypes of rice varieties were used in an experiment to determine their tolerance and susceptible levels against drought stress. Two different concentrations of PEG 8000 viz., 5% and 10% were used along with control. The experiment was designed in a complete randomized design with three replications. During germination test, result showed out that of 17, only 5 rice genotypes (Towuti, NMR 151, NMR 152, Bina-10 and FR13A) demonstrated above 80% survival rate germination. Based on Standard Evaluation System (SES), 5 (2 as check variety and 3 as variety of study) genotypes were selected primarily. Increasing in water stress level showed a decreasing in shoot length and dry weight in all rice genotypes tested. Among the 3 genotypes, FR13A showed the lowest drought score. The maximum shoot length was observed in the controlled condition (23.54 ±0.32 cm) by FR13A. As for the dry weight, the lowest dry weight in gram were recorded by NMR 152 with 0.015 ±0.003 g at 10% PEG and the highest is FR13A with 0.040 ±0.012 g at control. The highest relative seedling height (99.06%) by NMR 152 was recorded at 5%. At 10% PEG, the highest relative dry weight was found in NMR 152 at 5% PEG with 91.19% as the lowest (59.46%) was found in NMR 151 at 10%. Result in this study indicate that 10% of PEG is not enough to induce the optimum drought stress. Based on overall results, FR13A showed a better tolerance against drought compared to NMR151 and NMR152. This genotype may be used as positive or tolerant controls in future studies. Finding in this study would also be a significant endeavor to researchers in the future to develop new rice variety either through mutation or cross breeding to increase the number of good rice varieties against drought.