Poster

INTROGRESSION OF *SUB 1* GENE INTO SOME POPULAR IMPROVED RICE VARIETIES AND PERFORMANCES OF DERIVED BREEDING LINES

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ABSTRACT

Flooding is a major constraint for rice cultivation in the Low Country Wet Zone (LCWZ) especially, Kalutara, Matara, Galle, Rathnapura, Colombo and Gampaha districts. At present, frequent crop losses due to floods are reported in Dry and Intermediate zones of the country too. So in Regional Rice Research & Development Centre, Bombuwela initiated a rice breeding program in *Yala* 2011 to incorporate submergence tolerance controlled by *sub 1A* allele in order to improve submergence tolerance in popular rice varieties. Back cross breeding program was conducted with phenotypic screening in an artificial water tank. In this programme the recurrent parents (Bw 363, Bw 372, Bw 367, Ld 368) were crossed with IRRI donor parents having *sub 1A* allele (IRRI 119, IR07F291, IR07F101, IR49830-7-1-2-3) and F_1, BC_1F_1, BC_2F_1, BC_3F_1, BC_4F_1,BC_4F_2, BC_4F_3, BC_4F_4 and BC_4F_5 generations were raised. In each back crossed population, tank screening was practiced and selected tolerant plants similar to recurrent plant type were back crossed to the recurrent parents. In the tank 10-day old seedlings were screened for submergence tolerance for 14 days having 1m deep water column (from soil surface to water surface). De-submerged plants were scored after 2 days to 7 days for their recovery rate. Submergence intolerant plants displayed greater shoot elongation while submergence tolerance plants showed restricted elongation during submergence. During de-submergence all susceptible lines withered and perished while tolerant lines showed different survival rates. None of the tested lines showed 100% survival, but some lines showed more than 75% survival rates, namely, NP 14-7-I- 75%, BwNP 14-7-V-80%, BwNP 14-8-I- 90% and BwNP 14-20-VI- 80%. and they were assigned the survival score of 5. According to the observations the most compatible donor parent IRRI 119 showed the survival rate of 95%. Two lines namely BwNP14-8-I (BC_4F_5 of Bw363/IRRI119) and BwNP14-16-III (BC_4F_5 of Bw363/IRRI07F102) were genotypically confirmed the presence of submergence tolerance allele with SSR marker RM 23869, which is tightly linked to the *Sub 1A* allele using 2% agarose gel electrophoresis. Further, the result suggested that the conventional back cross method followed in this study is successful for in-cooperating *Sub 1A* allele to our improved varieties to avoid the crop losses due to unexpected floods in the country even in both Dry and Intermediate zones.