

PHENOTYPIC AND GENOTYPIC SCREENING OF F₂ AND F₃ GENERATIONS IN RICE (*ORYZA SATIVA L.*) FOR SUBMERGENCE TOLERANCE

A. Kamatchi & K. Paramasivam

Research Scholar, Department of Plant Breeding and Genetics, Pandit Jawaharlal Nehru College of Agricultural and
Research Institute, Karaikal, Tamilnadu Agricultural University, Coimbatore, Tamil Nadu, India

ABSTRACT

Pedigree-based selection method combined with marker-assisted selection (MAS) provides a suitable resource for deriving elite lines with more favorable characters. The aim of the present investigation was to analyze the using field experiments and molecular markers we evaluated diversity of rice advanced F₂ and F₃ lines derived from cross ADT46/ Swarna sub1 aimed to select elite line(s) with favorable characters [High yielding variety / resistance to the submergence tolerance (sub1 genes)]. Selection for several important traits, including resistance to high yielding, resistant to submergence tolerance (SUB1 gene) was conducted during 2 and 3 generations. Genetic diversity of F₂ and F₃ lines was studied using 288 and 11 polymorphic loci produced by long AP-PCR primers. Results showed that there was a great diversity within and between studied advanced lines. Average gene diversity across polymorphic loci for the two generations was 20.3% and 8.5%, respectively. Phenotypic evaluations in combination with MAS helped us to identify among the F₂ segregants phenotyped for submergence tolerance, 84 per cent of the individuals were survived after de-submergence as compared to 90 per cent of survivability in resistant donor viz., Swarna Sub1 and FR13A. Our results markedly show that selection made by breeder has diverse effects on genetic structure of plant material, particularly in favor of fixating genetic background of superior parent.

KEYWORDS: Phenotypic and Genotypic Screening, Polymorphic Loci, SIB Analysis, Submergence Tolerance

Article History

Received: 29 Aug 2019 / Revised: 06 Sep 2019 / Accepted: 20 Sep 2019
