PHENOTYPING OF BREEDING POPULATIONS IN COMPLEMENT WITH MOLECULAR MARKERS TO SELECT SUBMERGENCE TOLERANT RICE (*Oryza sativa)*

A dissertation submitted to the

Faculty of Animal Science and Export Agriculture of

Uva Wellassa University

in partial fulfillment of the requirements for the award of the degree of

Bachelor of Science in Export Agriculture

By

JEWENDRA GAMLADDALE DILINEE CHATHURANGANEE GUNADASA

Faculty of Animal Science and Export Agriculture

Uva Wellassa University

2013

ABSTRACT

Rice (*Oryza sativa*) is typically in wet, dry and intermediate zones in Sri Lanka under partially flooded conditions. Around 75000 ha have been affected by submergence in year 2013 all over the country. This will create the poor yield in submerged areas with intolerant varieties. To fulfill the national requirement of paddy yield, rice breeders should select the appropriate varieties for those areas. In response to that, the research programme executes to select submergence tolerant trait (Sub 1 A) using marker assisted selection method in complement with morphological screening. In this research, 10 days old seedlings of BC_2F_1 (Bg 360/Swarna Sub 1//Bg 360) population which consist with 526 plants were morphologically screened by submerging in 1m depth of water for 10 days with the parents (recurrent: Bg 360 and donor: Swarna Sub 1). The plants were scored for survival and elongation at desubmergence and for recovery 14 days after desubmergence. Recovered plants were subjected to molecular screening. Rice Microsatellite, flanking marker RM219 was used as the marker to check the polymorphism between Bg 360 and Swarna Sub 1. Plant numbered 72-20, 72-18, 72-11, 72-3 and 77-69 were selected from both molecular and morphological screening. Those plants showed heterozygous loci for RM 219. Those plants can be advanced for obtaining BC_2F_2 or BC_3F_1 generations. Plants which were homozygous, they should be subjected to further analysis by using an upstream marker to see whether they are recombinats or not.

Key words: Rice microsatellite, Rice (*Oryza sativa*), Sub 1 gene, Submergence tolerance.