Phatsalakone Manivong 2014: Marker Assisted Pyramiding of Submergence Tolerance, Blast Resistance and Fragrance in Glutinous Rice. Master of Science (Tropical Agriculture), Major Field: Tropical Agriculture, Faculty of Agriculture at Kamphaeng Saen. Thesis Advisor: Mr. Theerayut Toojinda, Ph.D. 93 pages.

Current local rice cultivars grown by Lao farmers are intolerance to long periods of flooding and susceptible to blast disease. In this study, we develop the new bred glutinous varieties that have fragrance, submergence tolerance and blast resistance characters while have plant type and yield potential similar to the popular Laotian TDK1 variety by using marker-assisted selection (MAS). The three-ways cross (TDK303/IR85264/RGD07529) was made and the progenies were subjected to MAS using six markers, Aromarker, R10783indel, RM212, RM319, RM144 and RM224, were used to select the favored alleles of the *badh2, Sub1, qBL1 and qBL11* loci, respectively. Twenty eight F5 lines were selected and tested for submergence tolerance, blast resistance, fragrance and agronomic characteristics and compared with those of the parents. All of breeding lines exhibited submergence tolerance, blast resistance and fragrance. A wide range of agronomic characteristics was observed in the breeding lines and some breeding lines had shown very good characteristics. This study provides further support that the precision of markers used in MAS can enhance the development of rice varieties in Laos breeding program.

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