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COMBINATION OF INDUCED MUTATION AND HYBRIDIZATION METHODS FOR RICE BREEDING

Breeding for aromatic rice varieties having high grain quality, insect and disease resistance ability and increased yield is the objective of this research to satisfy domestic consumers and increase commercial value for exported market. The procedure to obtain the mutants may be summarized as follows: seeds of local Tam Thom TT1 and ST3 were incubated in a water bath at 33 °C for 48 h to induce germination to obtain high-frequency gene mutation. They were then irradiated by gamma-rays from a ⁶⁰Co facility at 15 krad (150 Gy) dose. After 24 h, the seeds were sown in a field nursery to obtain the first generation (M1). Phenotypic selections began at the M3 generation. We selected two mutant rice lines in M5 named Tam Thom T3 and Mutant ST3. Mutant Tam Thom T3 line is highly resistant to leaf blast disease, is early maturing and has a semi-dwarf stature. Individuals, including mutants were propagated through self-fertilization, and phenotypes were evaluated and selected at each generation to develop pure-bred lines. Data on plant height (cm), number of effective tillers/plant, panicle length (cm), number of filled grains/panicle, 1000 seed weight (gr), days to maturity and grain yield were recorded in our example. After harvesting, the seeds of each genotype were dehulled for evaluation of the grain quality, viz. grain size (grain length), grain shape (grain length-breadth ratio) and also aroma. But pure-bred lines have small panicles so these lines were used for combination. Thus, a combinatorial approach between hybridization and induced mutation can be used for breeding. Multiline crossing was carried out on mutant rice lines, aromatic rice and others, such as Huong Com 1/mutant ST3//mutant Tam Thom T3//R15///ST20////ST20. After strict processes of selection through 8 generations by qualitative and quantitative anticipated targets (growth duration, plant architecture, grain shape, high yield, aroma, insect and disease resistance), we selected two aromatic rice varieties named as ST22 and ST24 in 2016

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