MOLECULAR GENETIC ASSESSMENT OF SOME RICE MUTANTS INDUCED BY GAMMA IRRADIATION

By

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B. Sc. Agric. Sc. (Genetics), Tanta University, 2000

M. Sc. Agric. Sc. (Genetics), Ain Shams University, 2009

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ABSTRACT

Mohammed Hussein Essa Ayaad. Molecular genetic assessment of some rice mutants induced by gamma irradiation. Unpublished Ph.D. Thesis, Department of Genetics, Faculty of Agriculture, Ain Shams University, 2015.

Five local rice cultivars (*Oryza sativa,* L.*)*; Sakha 101 (SK101), Sakha 102 (Sk102), Sakha 103 (Sk103), Giza 177 (Gz177) and Egyptian Jasmine (E. Jas), in addition, eight mutant rice genotypes in M_6 generation; Egy22, Egy23, Egy24, Egy202, Egy32, Egy33, Egy34 and Egy316 were used in this study. These genotypes were used to evaluate yield-related traits, cooking and eating quality traits, aroma content and blast disease resistance. Egy316 (111 days) was earlier than other genotypes and recorded the highest 1000 grain weight (32.7g), while the mutant Egy202 revealed the maximum number of panicles/m^2. Maximum grain yield (4.67 ton/fed.) was recorded by Egy22, and was the strongest aromatic genotype. While Gz177 showed the highest head rice percentage (HR%) followed by Egy24. On the other hand, the highest amylose content percentage (AC%) was recorded by Egy23 (25.3 %). Under natural and artificial infection of blast disease all studied genotypes were resistant except Sk101. Thirty two SSRs primers were used to detect early maturing, high tillering, aroma content and blast disease resistance. a- The sizes of SSRs fragments ranged from 50-2917 bp. The total number of amplified bands were 69 bands, while the total number of polymorphic bands, 67, representing 97 % polymorphism. The RM125 primer showed divided the 13 genotypes into two groups according to grain shape, while RM135 showed one unique positive marker on the high tillering mutant (Egy202).

Key words:

Rice, SSRs, Mutation, Early maturing, High tillers, aroma, blast disease .

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