Development of two high yielding mutant varieties of mustard [Brassica juncea (L.) Czern.] through gamma rays irradiation

ABSTRACT

Seeds of the well-adapted and popular mustard variety BARIsarisha-11 were irradiated with gamma ray using 60Co gamma cells. Irradiated seeds were grown as M1 during 2004-05. Selection was made from M2 generation during 2005-06. Desirable mutants were confirmed in M4 generation during 2007-08 and ten true breeding mutants having higher seed yield per plant with desirable morphological characters and yield attributes were selected. Selected mutants were evaluated along with the mother variety BARIsarisha-11 to select the most desirable ones considering higher seed yield and improved yield attributes under different replicated yield trials during 2008-09 to 2010-11. Results showed that two mutants, MM-10-04 and MM-08-04 selected from 700 Gy produced higher seed yield than BARIsarisha-11 in most of the trials conducted in 13 locations of Bangladesh. Mean of three years trial showed that seed yield of MM-10-04 and MM-08-04 was 2043 and 1893 kg ha-1, respectively, which was 23% and 14% higher than BARIsarisha-11 (parental plant). Mutants MM-10-04 and MM-08-04 also had the higher number of siliquae plant-1, 1000-seed weight and oil content than BARIsarisha-11. These two mutants also showed tolerance against Alternaria blight disease and lower aphid infestation. Results of the yield trials as well as screening against Alternaria blight disease and aphid carried out across the country indicated that MM-10-04 and MM-08-04 were suitable for widespread cultivation. Consequently, the National Seed Board of Bangladesh registered MM-10-04 and MM-08-04 in 2011 as two high yielding mustard varieties, Binasarisha-7 and Binasarisha-8, respectively for commercial cultivation.

Keyword: Gamma rays; Induced mutants; High yielding; Brassica juncea