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Macro and micro mutations, in gamma-rays induced M_2 populations of Okra (*Abelmoschus esculentus* (L) Moench)

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SUMMARY

An experiment was conducted at RBS College, Bichpuri Farm in the *Zaid* and *Kharif* seasons of 2003 to workout mutations in gamma-rays induced M_2 populations in Okra. For the experiment the dry seeds of okra variety Arka anamika were got treated with gamma-rays doses of 15, 30, 45, 60 and 75 kR on Feb. 22nd 2003. The treated seeds alongwith control (untreated) ones were sown on 22nd Feb. 2003 to raise the M_1 generation in the field. The seeds were collected from all of the competitive M_2 plants at the time of maturity of M_1. The M_2 was raised in *kharif* 2003 in separate progeny rows of all compatitive M_1 plants from each of the treatments and the observations were recorded on chlorophyll and other viable mutations and for number of fruits per plant, fruit length and fruit yield per plant characters. The analysis of variance was made treatment wise and the estimates of parameters of statistical and genetic variability with heritability and genetic advance were made treatment wise for the three characters under study. The results revealed recovery of chlorophyll and other viable mutations of plant, leaf, fruit and seed types. Some of which recovered under 30 kR were of economic importance and that the treatments had significant effect on the three characters. Under 30 kR the mean fruit number / plant, fruit length and fruit yield/ plant were increased as compared to control. The estimates of range, environmental, genotypic and phenotypic variances with their coefficients and heritability and genetic advance were higher under 30 and 60 kR but lower in other doses than those under control. 30 kR was emerged as the best treatment with 75 kR to have drastic effect.

Key words : Okra, Mutations, Bifurcated fruits.

Mutation breeding has been an important supplement to other conventional methods for the development of new plant types or varieties with better physio-agronomic adaptation and homeostasis and superior biochemical composition. It has also been a dominant force in the evolutionary process through the production of new additional heritable variations which may be utilized in traditional recombination breeding programmes. Therefore, the present investigation was undertaken in okra variety Arka anamika, to assess a beneficial dose of gamma rays with respect to improvement in this crop.

MATERIALS AND METHODS

The dry seeds of Arka anamika variety of Okra after having got treated with gamma-rays doses of 15, 30, 45, 60 and 75 kR were used to raise the M_1 generation in *zaid* 2003 in the field. To raise the M_2 generation the seeds from the competitive M_1 plants were collected from each of the treatments separately and were sown in separate progeny rows of 2 m length with spacing of 50 X 20 cm replicated 4 times on June 25, 2003.

The treated and control populations were carefully screened out for chlorophyll mutations at two leaf stage, for other viable mutations various stages of growth and development of plant, leaf and fruit type mutations and after harvest for seed type mutations. For the identification and classification of chlorophyll and other viable mutations procedure proposed by Gustafsson (1940) was followed.

The other observations were recorded on single plant basis for the characters viz, fruit length, number of fruits per plant and fruit yield characters. The analysis of variance was made treatment-wise for the characters under study according to Panse and Sukhatme (1961) and the estimates of parameters of statistical variability viz, range, mean, cv and genetic variability viz. genotypic, phenotypic and environmental variances with coefficients of genotypic and phenotypic variances and heritability in broad sense and genetic advance (expected) were calculated by usual methods.

RESULTS AND DISCUSSION

The control and treated M_2 populations were screened out for the macromutations viz, chlorophyll and other viable mutations. The macromutations recovered in M_2 generation of present study are being described as given below.

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