

## Response of okra to gamma rays and EMS in M<sub>1</sub> generation

P.D. DALVE, A.M. MUSMADE, S.V. MANE AND R.R. NIMBALKAR

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See end of the article for authors' affiliations

Correspondence to:

**P.D. DALVE**

Department of  
Horticulture, Mahatama  
Phule Krishi Vidyapeeth,  
Rahuri, AHMEDNAGAR  
(M.S.) INDIA

### ABSTRACT

The experiment was conducted to study the response of okra (cv. PHULE UTKARSHA) to gamma rays and EMS in M<sub>1</sub> generation. During the present study the various characters of okra were influenced by irradiating the planting material with gamma rays, EMS and combination of both mutagens. The germination percentage was decreased and mortality percentage was increased with increase in both mutagens and combination of the same. Days for first flower appearance, 50% flowering and days required for first fruit set was increased with increase in mutagenic doses. The height of plant, nodes per plant, number of fruits per plant, green fruit yield per plant, per plot and per hectare was somewhat decreased with increase in the mutagenic doses. The observed variability in all the mutagenic levels for various characters studied, revealed the scope for improvement in this crop.

**Key words :** Gamma rays, EMS, Okra, M<sub>1</sub> generation

Okra (*Abelmoschus esculentus* L. Moench) is very important vegetable crop in India and throughout the world. Various breeding methods were followed for crop improvement in okra especially for resistance to biotic and abiotic stresses. Out of all breeding methods, mutation breeding has been made extensively in several crops and it has a great scope for crop improvement in vegetable crops. It causes sudden heritable change in the organisms and improve the oligogenic characters of the crop plants without much altering the polygenic characters. By considering, the past and present demand for crop improvement in okra the present study was undertaken in okra cv. Phule Utkarsha.

### MATERIALS AND METHODS

For the present study, dry seeds of okra cv. Phule Utkarsha were irradiated with 20, 30 and 40 kr <sup>60</sup>Co gamma rays at Bhabha Atomic Research Centre, Trombay (Mumbai). The EMS treatment was given at Department of Biotechnology, Mahatma Phule Krishi Vidyapeeth, Rahuri (MS) with 0.1, 0.2 and 0.3% aqueous solution of EMS for 12 hrs. Remaining three treatments were combination of gamma rays and EMS viz., 20 kr gamma + 0.1% EMS, 30kr gamma + 0.1% EMS and 40kr gamma + 0.1% EMS, the gamma irradiated seeds were used for the above treatments with intermittent shaking at room temperature. Untreated seeds were sown as control. The experiment was conducted at All India Coordinated Vegetable Improvement Project, Mahatma Phule Krishi Vidyapeeth, Rahuri (M.S.) in June 2008. The sowing was done in randomized block design with ten

treatments and three replications at 60 x 45cm spacing for raising M<sub>1</sub> generation. Observations regarding germination %, mortality%, plant height, nodes per plant, days required for first flower appearance, 50% flowering and first fruit set, number of fruits per plant, green fruit yield per plant, per plot and per hectare were recorded.

### RESULTS AND DISCUSSION

From Table 1, it was revealed that, the germination % of okra significantly influenced by mutagenic treatments, increase in dose of gamma rays and EMS reduces the germination. It was less (83.33%) in T<sub>9</sub>, 40 kr gamma + 0.1% EMS followed by T<sub>8</sub> (83.40%) 30 kr gamma + 0.1% EMS. The maximum germination % was in control treatment *i.e.* 89.66% followed by T<sub>1</sub>, T<sub>4</sub>, T<sub>2</sub>, T<sub>3</sub> and T<sub>5</sub>. Similarly mortality % was affected by various mutagens. Maximum mortality was found in combination of both mutagens *i.e.* T<sub>9</sub> and T<sub>8</sub> (17.49 and 17.33 %, respectively). Significantly less mortality was observed in control treatment followed by 20, 30, 40 gamma rays and 0.1, 0.2 and 0.3 % EMS treatments. The present results were similar with Singh *et al.* (2000) and Kumar and Mishra (2004).

The maximum plant height (135.50 cm) and nodes per plant (22.67) were recorded under control, while it was reduced in combination of gamma rays and EMS (height T<sub>9</sub>, 121.14 cm, T<sub>8</sub> 122.33 cm, nodes per plant T<sub>9</sub>, 17.35 and T<sub>8</sub> 18.14). All other treatments showed intermediate results between these treatments. Similar results were recorded by Dhankar and Dhankar (2003) in okra.