

Radiation induced *in vitro* mutagenesis in two important ornamental plants: *Celosia* and *Zinnia* species

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Report:

The objective of the study was to induce mutation in two important ornamental plants *Zinnia* species belongs to the Asteraceae and *Celosia* species belongs to Amaranthaceae. The seeds of *Zinnia* and *Celosia* were irradiated at different doses. Germination and survival of the irradiated seeds was carried out. The seeds were irradiated using ^{60}Co as source of gamma rays at Bhabha atomic research centre, Mumbai. The selected dose rates were 10Gy, 20Gy, 50Gy, 75Gy, 100Gy, 125Gy, 300GY, 400GY, 500GY, 600GY, 700GY, 800GY, 900GY and 1000GY to determine the LD50. LD50 of zinnia and celosia was standardised. Tissue culture of *Celosia* was standardised. In later stages the celosia plants were dropped from the project due to the difficulties in the process of self-pollination and seed collection.

The selected gamma ray doses for *Zinnia* species was 75Gy, 100Gy and 125Gy to which it responded positively towards getting novel variations.

The seeds were irradiated, sown and the flowers obtained were self-pollinated and bagged manually. The plants were watered on daily basis. The emergence of seedlings started after four days of sowing. After fifteen days emerged plants were counted. After one month of germination different morphological characters were recorded like the plant height, number of flowers, flower size, number of whorls of petals, number of branches, number of nodes and inter nodes was recorded. The morphological characteristics were recorded on daily basis up to the M₅ generation.

The control plants were nearly 15 - 20 inches tall, dreamland pink colour with double whorled flowers. Stable variations were observed in flower colour and morphology in the plants derived from irradiated seeds upto the fifth generation. The flower colour varied from white, yellow, light yellow, orange, light pink, pink dots on ray florets and peach were observed. The flower morphology varied from curled ray florets, increase in the number of whorls to absence of ray florets (male sterile plant). The decrease in the plant height was

observed in white flowered plants compared to control plants. Increase in the number of flower and branches were observed in 100Gy treated plant compared to control plants.

The tissue culture studies were standardised for *Celosia*. In *Zinnia* tissue culture standardisation is in progress especially with the ones with no ray florets (as there is no seed set) and novel white variety which is the resultant of irradiation.

Molecular characterisation and karyotyping is in progress.