



XA0201323

Gamma ray induced mutants in Coleus

The germplasm collection of Chinese potato (*Coleus parviflorus* Benth) contains almost no variation for yield contributing traits. The crop does not produce seeds. Treatment of underground tubers with 1 kR, 2 kR, 3 kR and 4 kR gamma rays resulted in 50 morphologically different mutants, which are maintained as mutant clones. In the M_1V_1 generation, suspected mutant sprouts, were carefully removed and grown separately. The most interesting mutant types are the following: (i) erect mutant with spoon shaped light green leaves, 30 cm long inflorescences against 20 cm in the control, cylindrical tubers measuring ca. 7.0 cm long and 3 cm girth against 4 cm and 2.5 cm in the control (ii) early mutants 1 and 2, one having less leaf serration, the other having light green small leaves and dwarf type (iii) fleshy leaf mutant, dark green, thick and smooth leaves. For more details see the Table. Control plants spread almost in 1 m² area and bear tubers from the nodes of branches. In the early mutants tuber formation is mainly restricted to the base of the plant, which makes harvest easier. The crop usually matures within 150 - 160 days, the early mutants are ready for harvest 100 days after planting. As the mutants are less spreading, the yield could be increased by closer spacing.

Table: Characteristics of gamma ray induced mutants in Coleus

	Vine length	Internode length	Leaf length	Leaf width	Days to flower	Tuber no/ plant	Tuber wt/ plant
Erect mutant	21.5	4.3	3.1	2.4	65	20	233
Early mutant 1	19.0	3.2	3.4	3.0	58	37	228
Early mutant 2	17.7	3.0	2.5	2.0	56	34	183
Fleshy leaf mutant	27.5	4.2	4.3	3.5	68	22	187
CP-11 (control)	38.5	6.3	5.1	6.0	105	45	256

(Contributed by K. Vasudevan and J.S. Jos, Central Tuber Crops Research Institute, Trivandrum, Kerala, India).

Induction of male sterility in rice using chemical mutagens

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To diversify the sources of cytoplasmic male sterility for hybrid seed production in rice (*Oryza sativa* L.) attempts were made to induce this character in a popular *indica* cultivar PR 106 through chemical mutagens. Seeds were treated with 0.4% ethidium bromide (EB) for 24 or 48h at 10°C, with 0.4% ethyl methanesulphonate (EMS) for 24 or 48h at 10°C for 16 hr at 20°C or with 0.2% streptomycin sulphate (SM) for 24 or 48 hr at 10°C. In M_2 male sterile plants were detected in eleven different progenies, one from SM treatment and the remaining from EMS treatments. All the sterile plants had 100% non-stainable aborted pollen. Seed set upon open-pollination of the male sterile plants with the variety PR 106 ranged from 0.03 to 4.93 per cent whereas no seed

formed in bagged panicles. In M₃, open-pollinated progenies of the male sterile plants and their fertile sibs were further studied. Two progenies segregated for male sterility, all others had only fertile plants. In one of the segregating progenies, five out of six and in the other nine out of fourteen plants were male sterile. The progenies of fertile sibs did not have any male sterile plant. The results indicate that sterility of cytoplasmic type has been induced by EMS. The parental variety PR 106 acts as the maintainer.

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Mutants for plant height in hexaploid triticale

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Four hexaploid triticale varieties namely Beagle, Coorong, TL 419 and Welsh were subjected to gamma rays (100 Gy, 200 Gy, 300 Gy) and to aqueous solution of EMS (0.5%, (8h, 12h, 16h).

In all four varieties, three types of mutants for plant height were observed:

- Semidwarf - the mutant plants are 20-25 cm shorter than the shortest plant in the control.
- Dwarf - mutant plants grow up to 40-60 cm.
- Stunted - mutant plants grow up to 10-20 cm.

The segregation pattern suggests that semidwarf mutants are quantitatively inherited, showing continuous segregation in M₃, M₄ and M₅, whereas 'dwarf' and 'stunted' are monogenic recessive. They showed true breeding in M₃ and later generations.

The semi-dwarf, dwarf and stunted mutants can be used as initial material for development of new varieties with short straw and resistance to lodging.

REFERENCE

REDDY, V.R.K., Chromosome constitution and induced mutations in hexaploid triticale (X. Triticosecale Wittmack) Ph.D. Thesis, Meerut University, Meerut, India (1985).

(Contributed by V.R.K. Reddy and P.K. Gupta, Department of Agricultural Botany, Institute of Advanced Studies, Meerut University, Meerut, India).

Gamma ray induced high yielding dwarf mutant in Vigna radiata L. Wilczek

Single and combined treatments with gamma rays and EMS were tried on V. radiata (L. Wilczek) variety K 851. Seeds were exposed to 10, 20 and 30 krad gamma rays. One set of each dose was treated with 0.25% EMS solution (pH 7 at 30°C) for 6 hours. The M₂ generation was screened for mutants.

A dwarf mutant with signs of higher yield was observed in the 20 krad plot. The mutant exceeded the parent variety in several agronomic traits and was true breeding in M₃. Crossing with the control confirmed its monogenic and recessive character. Significant increase was found in number of pods/plant and number of seeds/pod (Table) leading to higher



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