Table 1. Performance of mutant and check varieties of niger during Kharif and Rabi seasons average over 1990-91 and 1991-92

Mutant/ variety/season		Days to maturity	Plant height (cm)	Capitula/plant	Seeds/capitulum	1000-seed weight (g)	Seed yield (q/ha)
ONS-107	K	115	168	25.8	18.4	3.82	5.04
	R	108	78	26.2	19.0	3.85	5.18
ONS-114	K	115	172	22.1	18.8	3.89	4.27
	R	106	81	22.3	19.9	3.98	5.27
ONS-125	K	110	156	18.9	18.8	4.06	3.86
	R	103	80	22.1	20.4	4.23	5.52
ONS-130	K	107	138	20.4	18.2	3.96	4.44
	R	99	71	20.9	19.6	4.18	4.56
IGP-76 (NC)	K	111	163	16.3	17.4	3.63	3.16
	R	103	73	19.6	18.7	3.92	4.46
GA-10 (ZC)	K	118	184	18.4	17.4	3.79	3.53
	R	107	83	20.9	19.9	3.94	4.73
S.Local (LC)	K	120	190	20.2	16.4	3.46	3.56
	R	110	85	21.2	16.6	3.55	3.92
C.D. (5%)	K	5.4	11.4	2.6	2.2	0.26	0.85
	R	4.1	7.2	2.2	1.9	0.22	0.72

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SEED MUTAGENESIS IN *Portulaca grandiflora* (Hook)

Betalain pigments have been used as natural additives. Despite their importance, the biochemistry and genetics of betalain synthesis remain relatively undetermined [1]. *Portulaca grandiflora* represents an ideal material for genetic analysis [2]. In the present work, seed mutagenesis was examined with a view to enhance the chance of detection of new genetic markers in this species.

White ('PgBmj') and red ('PgR') seeds of *Portulaca grandiflora* were treated with ethyl methanesulfonate (EMS) at concentrations ranging from 1.2 to 40% in 0.1 M phosphate buffer (pH 7.0 at 22 ± 2°C) for 4 hours, or with sodium azide (NaN_3) at concentrations ranging from 2.5 to 30 mM in 0.1 M phosphate buffer (pH 3.0 at 22 ± 2°C) for 1 hour. In another set of experiments the presoaked seeds (sterile water, 6, 16, 28 hours at room temperature 22°C) were treated with 1.2% EMS and 2.5 mM NaN_3 for two hours with shaking of the seeds at 30°C. After the mutagen treatments, the seeds were washed to removing the mutagens.

In the M_1 generation, germination and survival percentage of both cultivars decreased. For the selection of mutants, M_2 segregation progenies were raised from seeds of M_1 plants. The frequency of mutated plants was evaluated in the M_2 generation (Table 1).

Table 1. Frequency of viable mutations in the M_2 generation of *Portulaca grandiflora*

Cultivar	Mutant types	Total No. of plants	Mutated M_1 plants
PgBmj	dwarf	938	217
	late flowering	938	99
	female-sterile	252	2
	male-sterile	162	6
PfR	dwarf	459	144
	dwarf (altered leaves)	409	1
	late flowering	459	53
	female-sterile	370	7
	male-sterile	459	5

Five morphological mutations, namely, dwarf (Dw_1), late flowering (Flt), male-sterile (Sm), female-sterile (Sf) and dwarf mutant with altered leaves (Dwr_2) were selected from the M_2 population. Some mutants, identical with those scored in *Portulaca* were identified in another species [3, 4].

The higher frequency of mutants was obtained from treatment of seeds with 4.8% EMS concentration in variety PgR and from 20 mM NaN_3 treatment in variety PgBmj. In the M_3 generation, segregation for *Dwr_1*, *Dwr_2*, *Sm* and *Sf* revealed that these mutations are recessive to normal plants. The experiment proved that EMS and NaN_3 were effective in inducing phenotypic variation. This is the first report on inducing variability in *Portulaca* through mutagenic treatment. The new gene markers identified will be of great value for studying the genetics of *Portulaca grandiflora.*

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GENETIC ANALYSIS OF SUNFLOWER CHLOROPHYLL MUTANTS

The method of getting the chlorophyll mutations in sunflower was developed by Y.D. Beletskii in 1969 with the use of N-nitroso-N-methylurea (NMH) [1; 2]. Certain concentrations of NMH are known to induce plastid mutations in growing seeds, and their yield depends on the duration of the exposure [3]. The given work presented studieds on the influence of rifampicin (R) and 2,4-dinitrophenol (DNP) on the genetic activity NMH, as an inductor of plastid and nuclear mutations.