



## Induced seed and pod colour mutations in urdbean [*Vigna mungo* (L.) Hepper]

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Almost all the varieties of urdbean crop generally carry rough black seed with black pods. Shining seed colour is appreciated by consumers and farmers. Four hundred uniform, healthy and dry (9.5% moisture) seeds of cultivar Pant Urd-30 were treated with <sup>60</sup>Co gamma rays (10, 20, 30 and 40 kR doses), EMS (0.2, 0.4, 0.6 and 0.8%) and combination of gamma doses, viz., 10, 20, 30 and 40 kR with 0.2% EMS. In the M<sub>2</sub> generation, eight double mutations (Fig. 1 and 2) for seed and pod colour were observed in varied frequencies in mutagen treated populations (Table 1). The mutants with black shining seeds and black pods were found with the highest frequency (28%) followed by golden shining seeds and black pods (25%). All the mutants were compared with the parent (Pant Urd-30) as well as the standard check (T-9) in the M<sub>4</sub> generation using randomized block design with three replications during Kharif, 2002. The data were recorded on 10 randomly selected plants from each replication for different yield and yield attributing traits viz., plant height, number of pods per plant, pod length, number of seeds per pod, 100-seed weight and grain yield per plant. Days to

flowering and days to maturity were observed plot basis. The total seed protein (%) content of all the eight mutants, the parent and the standard check was estimated following the standard procedure given by Lowry *et al.* [1]. SM 3 (Seed Mutant 3) produced maximum grain yield per plant (7.38) followed by SM 1 (7.23) and SM 4 (7.08) (Table 2). The higher grain yield of the mutants were due to increased number of pods/plant, seeds/pod and 100 seed weight and possibly due to less infection of MYMV and less damage by the insects as compared to the check. Seed protein content (%) showed some increase in the mutants, in SM 1 (25.4%) followed by SM 5 (25.2%) and SM 3 (25.0%) as compared to the parent (24.3%) and the standard check (23.9%). Maximum 100-seed weight was observed in SM 2 (5.00) followed by SM 3 (4.96). All the eight mutants excepting SM 5 were earlier to mature than the check and all the mutants were earlier than the parent. Singh *et al.* [2] suggested that golden yellow tester mutant was likely to involve a single gene but the simultaneous variations for yields and other morphological characters indicate a gross change or

**Table 1.** Characteristics of the seed and pod colour mutants of urdbean

S.No.	Mutant	Mutagenic treatment (dose/cone.)	Frequency per 100 M <sub>2</sub> plants	Characteristics
1.	Parent (PU-30)	-	-	Black pods, black rough seeds, tall and medium yielding
2.	SM 1	30 kR	0.15	Brown pods, golden seeds, shining, tall and high yielding
3.	SM 2	20 kR+0.2%EMS	0.10	Brown pods, yellow rough seeds, tall and high yielding
4.	SM 3	30 kR+0.2% EMS	0.10	Brown pods, black shining seeds, tall and high yielding
5.	SM 4	30 kR+0.2% EMS	0.20	Brown pods, yellow and black spotted seeds, shining, tall and high yielding
6.	SM 5	20 kR+0.2% EMS	0.20	Brown pods, black rough seeds, tall and medium yielding
7.	SM 6	30 kR	0.25	Black pods, golden seeds, dwarf and low yielding
8.	SM 7	0.6% EMS	0.28	Black pods, black shining seeds, tall and low yielding
9.	SM 8	0.2% EMS	0.10	Brown pods, normal black rough seeds, dwarf and low yielding

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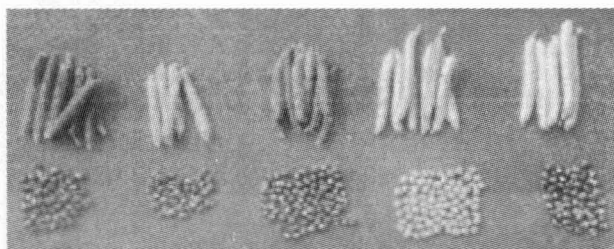


Fig. 1. Different combination of pod and seed colour mutations



Fig. 2. Plants with black (Normal) and brown (mutant) pod colour

Table 2. Mean values of yield and yield attributing traits of different mutants in  $M_4$  generation

Mutant line	Days to flowering	Days to maturity	Plant height (cm)	No. of pods plant <sup>-1</sup>	Pod length (cm)	No. of seeds pod <sup>-1</sup>	100-seed weight (g)	Grain yield plant <sup>-1</sup> (g)	Protein content (%)
SM 1	42.1	93.5	38.8	33.3	5.05	5.16	4.92	7.23	25.4
SM 2	45.5	95.7	36.6	28.6	4.55	5.04	5.00	6.89	24.8
SM 3	42.8	88.3	41.5	35.0	4.93	5.22	4.96	7.38	25.0
SM 4	40.0	86.5	38.7	34.6	4.86	4.79	4.84	7.08	24.7
SM 5	38.8	98.0	41.4	28.2	4.33	4.56	4.67	5.81	25.2
SM 6	40.5	89.2	36.8	25.7	3.76	4.98	3.74	4.45	24.4
SM 7	42.0	92.5	38.5	27.6	3.68	4.37	4.55	5.24	22.9
SM 8	42.2	89.8	32.7	23.8	3.57	4.49	3.79	4.77	22.7
Parent	45.8	100.2	41.9	26.8	3.85	4.71	3.92	4.85	24.3
Check (T9)	43.3	96.4	39.4	29.5	4.60	5.35	4.82	5.88	23.9
SE $\pm$ m	1.07	0.315	0.854	0.245	0.046	0.563	0.362	0.890	0.158
LSD (5%)	2.38	0.702	1.90	0.546	0.102	1.25	0.807	1.98	0.353

perhaps very closely related linked group of genes are controlling this trait. Such seed and pod colour mutants accompanied with higher grain yield and high protein content may be used as a variety or breeding line directly and indirectly for the future improvement in urdbean.

#### References

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