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INDUCED CODOMINANT MUTATION FOR DWARFISM IN LENTIL (*LENS CULINARIS* MED.)

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Induced mutation studies were undertaken in lentil with three cultivars, LL-78, Pant L-639 and Sehore 74-7. From mutagenized population of LL-78, one interesting dwarf mutant was isolated which is reported.

Dry, uniform seeds of three lentil cultivars LL-78, Pant L 639 and Sehore 74-7 were irradiated with 5, 10, 15 and 20 kR doses of gamma rays at the gamma cell installed in the Division of Genetics, Indian Agricultural Research Institute, New Delhi. The M_1 and later generations were grown at the Dholi Farm of the Rajendra Agricultural University, Bihar. From 20 kR treated of LL- 78 M_2 population, one semidwarf mutant was isolated which was late in flowering and maturity. It was grown in M_3 generation. Segregation was observed in M_3 for plant height into dwarf, semidwarf and tall plants. Due to smaller population size, genetic ratio could not be established. Plants below 15 cm in height were considered dwarfs and those above 25 cm were considered tall. Though there was some difficulty in such categorization, the plant type of these three groups was discernible visually. The dwarfs were bushy and easily identifiable, the semidwarfs were erect with profuse branching from ground level, and the tall plants were semispreading with fewer primary branches. Seeds of these three groups of M_3 plants were sown separately to raise M_4 generation. The dwarf and tall cultures bred true, but semidwarfs again segregated into dwarf, semidwarf and tall. In M_4 generation also, genetic ratio could not be established.

Crossing was attempted between M_4 dwarf plants and the tall parent. The F_1 plants were semidwarf. The F_2 was space planted and raised with higher nitrogen level, i.e. 40 kg N/ha (recommendation 20 kg/ha). The higher nitrogen dose was applied to obtain full expression of plant height in the semidwarf and tall plants. The F_2 population segregated into dwarf, semidwarf and tall in the ratio of 1:2:1 ($\chi^2 = 0.885$; $P = 0.05$). This confirmed that semidwarfism is due to a single partially dominant gene. The gene symbol, responsible for this character is proposed as Dw, with its recessive allele dw. The genotypes of the dwarf,

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semidwarf and tall plants will be Dw Dw, Dw dw and dw dw, respectively. The dwarf mutant was also studied in M_4 generation. The characters observed are listed in Table 1.

Table 1. Characteristics of induced dwarf mutant of lentil

Character	Dwarf mutant	Parent (LL-78)
Plant height	$8.5 \pm 1.04^{**}$	36.0 ± 3.22
Days to flowering	$90.0 \pm 3.60^{**}$	75.0 ± 4.05
Days to maturity	$140.0 \pm 3.68^{**}$	120.0 ± 4.33
Leaf (rachis) length	$1.28 \pm 0.04^{**}$	3.0 ± 0.07
Leaflet size:		
(a) length	$0.64 \pm 0.014^{**}$	0.95 ± 0.25
(b) breadth	0.21 ± 0.01	0.21 ± 0.01
Pods/plant	$16.2 \pm 2.25^{**}$	54.5 ± 6.31
Seeds/pod	$1.36 \pm 0.08^{**}$	1.82 ± 0.07

**Significant at P = 0.01.

The plant height of the dwarf mutant was much lower as compared to the parent plant. The dwarf mutant was also very late in maturity. Leaf (rachis) length, leaflet length, pods per plant and seeds per plant also decreased in the mutant, which is expected because the dwarf mutations generally have pleiotropic effect [1–2].

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