Short Communication

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INDUCTION OF MALE STERILE MUTANTS IN KHESARI (*LATHYRUS SATIVUS* L.)

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Two male sterile mutants were isolated in khesari (*Lathyrus sativus* L.) after seed treatment with 25 kr and 35 kr dose of gamma rays followed by soaking in 0.125% ethyl methane sulphonate (EMS) solution. Both the mutants showed reduction in plant height, number of primary branches and width of leaflets, they had dark green leaves compared to the control. Pollen grains of both the sterile plants were shrunken, irregular, empty and stained partially. Inheritance studies indicated that male sterility is governed by a single recessive gene.

Key Words : Male sterility, mutagens, *Lathyrus sativus* L.

The utilization of male sterility circumvents, the costly procedure of hand emasculation for hybrid seed production. Male sterile mutants have been induced by physical and chemical mutagens in a number of crop plants (Sharma and Sharma, 1978; Chaturvedi and Sharma, 1978; Singh and Chaturvedi, 1981; Narasimha Chary and Bhalla, 1988; Chaturvedi and Singh, 1990 and Shrivastava *et al.*, 1992). The present paper reports induction of completely male sterile mutants in khesari (*Lathyrus sativus* L.).

Dry seeds of khesari (*Lathyrus sativus* L.) var. P-505 were treated with 15, 25 and 35 kr gamma rays at Genetics Division, IARI, New Delhi. Some irradiated and some fresh seeds were also treated with 0.125% or 0.50% aq. solution of ethyl methane sulphonate (EMS) and diehyl sulphate (DES) respectively for 6 hours. Thus there were a total of 11 treatments and the control. After treatment with mutagens, the seeds were thoroughly washed in running tap water and planted in the field under normal cultural conditions. Seeds of M_1 plants were collected on individual plant basis and were sown in the randomized block single row design to raise the M_2 generation. The M_2 plants, showing reduced pod set or failure of pod development, were checkd for pollen sterility using acetocarmine test.

Two completely male sterile mutants were isolated from two different plant progenies, one obtained from 25kr gamma rays + EMS treatment and the other from 35kr gamma rays + EMS treatment. Gamma rays and EMS are powerful mutagenic agents and both are known to cause male sterility in plants (Shrivastava *et al.*, 1992).

Table 1 Main characters of male sterile mutants isolated in M_2 generation.

Characters	Mutant-1	Mutant-2	Control
Days to flower	88.0	106.0	80.0
Plant height (cm.)	47.2	39.2	57.3
No. of primary branches	5.0	3.0	7.0
Leaflet breadth (cm.)	0.4	0.6	1.0
Leaflet length (cm.)	3.1	2.8	5.2
Leaflet colour	Dark green	Dark green	Green
Pollen grain shape	shrunken, irregular	shrunken, irregular	healthy and rounded
Pollen sterility (%)	100.0%	100.0%	8.78%

Table 1 lists main characters of the two mutants and the control. Both mutants exhibit slight reduction in plant height and number of primary branches. The leaflets were small, narrow and dark green in colour compared to those of the control plants. The two male sterile mutants flowered 8 and 26 days latter than the control. All the floral parts, except anthers were normal in size in male sterile plants. The anthers were small and contained 100% sterile pollen. Pollen grains of both mutants were shrunken, irregular in shape, empty and stained poorly and partially with acetocarmine. Selfing did not set pods in any of the two mutants. Pod setting was normal after crossing with pollen of the control plant, which indicated that the mutant was female fertile. Of the 10 attempted pollinations on each mutant, 5 or 6 were successful. All the F_1 plants of these mutants were fertile indicating that male sterility character was recessive. In the F_2 generation one mutant segregated into 264 fertile and 83 sterile

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plants and the other segregated into 318 fertile and 97 sterile plants. The segregation behaviour fits in 3:1 ratio (X^2 = 0.216 and 0.585, P> 0.05) indicating that the trait is governed by a single receissive allele. The male sterile mutants can be used for mass hybridization in the development of composite crosses.

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