

Variability assessment in M₇-lines of fenugreek (*Trigonella foenum-graecum* L.)

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Abstract

The variability in 29 M-lines derived from gamma radiation at 10, 20, 30, 40 and 50 Kr dose along with three checks namely, RMt-1, RMt-143 and a local cultivar of fenugreek (*Trigonella foenum-graecum*) was estimated. Significant variability was recorded for days to flowering, plant height, pods per plant, seeds per pod, test weight, seed yield per plot, protein content and the incidence of powdery mildew disease. High genotypic and phenotypic coefficients of variation were observed for protein content, pods per plant, seed yield per plot and branches per plant. High broad sense heritability (>74%) coupled with high genetic advance (>31%) was recorded for protein content and pods per plant. Among the 29 M₇-lines, No. 20 (551-1) exhibited superiority over all the three checks and other lines, indicating the necessity for further evaluation of this line.

Key words: fenugreek, *Trigonella foenum-graecum*, variability.

Limited variability is available in fenugreek (*Trigonella foenum-graecum* L.), particularly for yield and yield related traits. Hence mutation breeding programmes were initiated through gamma radiation to generate variability and the promising lines so identified were evaluated for variability for different characters.

The material utilized in the present investigation consisted of 29 M₇-lines derived from 10, 20, 30, 40 and 50 Kr dose of gamma radiation to fenugreek variety RMt-1 and 3 checks (RMt-1, RMt-143 and local cultivar) The treatments along with RMt-1, RMt-143 and local cultivar were evaluated at Agriculture Research Farm, S K N College of Agriculture, Jobner during *rabi* 1997-98 in a randomized block design with three replications in a plot of 4 x 1.20 m² size

accommodating four rows, spaced at 30 cm apart with an intra row spacing of 10 cm maintained by thinning. The recommended package of practices were adopted to raise the crop.

Observations were recorded on days to flowering, plant height, branches per plant, pods per plant, pod length, seeds per pod, days to maturity, test weight, seed yield per plot, protein content, powdery mildew disease incidence and harvest index. The data were subjected to standard statistical analysis (Panse & Sukhatme 1967; Singh & Choudhary 1979). Protein content was estimated by the method of Snell & Snell (1939) and was expressed as per cent protein in each sample (AOAC 1960). The incidence of powdery mildew disease was

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Table 1. Yield contributing traits in M_7 -generation of fenugreek

Character	Mean	GCV (%)	PCV (%)	Heritability broad sense (%)	GA (as % of mean)
Days to 50% flowering	50.87	7.91	9.25	73.02	13.91
Plant height (cm)	88.89	5.22	10.65	24.03	5.26
Branches plant ⁻¹	4.86	6.10	16.11	14.33	4.72
Pods plant ⁻¹	32.59	17.61	20.38	74.64	31.35
Pod length (cm)	10.25	1.97	12.49	2.50	0.68
Seeds pod ⁻¹	15.16	5.19	8.74	35.17	6.32
Days to maturity*	130.44	-	-	-	-
Test weight (g)	13.24	7.19	7.78	85.42	13.66
Seed yield plot ⁻¹ (kg)	0.91	12.01	17.34	48.07	17.51
Protein content (%)	30.02	36.34	38.12	90.87	71.36
Powdery mildew incidence	30.37	9.93	19.73	25.35	10.30
Harvest index	27.67	5.26	15.50	11.53	3.68

*Further estimations were not done, as the GCV was negative.

GCV= Genotypic coefficient of variations, PCV= Phenotypic coefficient of variation, GA= Expected genetic advance

recorded using 0-9 score (Mayee & Datar 1986).

The analysis of variance revealed significant variability for days to flowering, plant height, pods per plant, seeds per pod, test weight, seed yield per plot, protein content and powdery mildew incidence. Shukla & Sharma (1978), Kohli *et al.* (1988) and Yadav *et al.* (1992) also recorded significant variability for these traits indicating that these traits can be used for further yield improvement in this crop. Very small differences between phenotypic and genotypic coefficients of variance were observed for days to 50% flowering, pods per plant, test weight and protein content (Table 1). It indicated that expression of these traits is not much influenced by the environment, and can be used for further improvement of this crop, directly. High GCV (> 12%) coupled with high broad sense heritability (> 48%) was recorded in protein content, pods per plant and seed yield per plot as reported earlier in fenugreek (Mehta *et al.* 1992; Reddy & Reddy 1991; Pant

et al. 1984). High genetic advance value ($\geq 30\%$) was recorded for protein content and pods per plant (Pant *et al.* 1984; Mehta *et al.* 1992; Reddy & Reddy 1991). Similar results for pods per plant in fenugreek were reported showing that most likely the heritability is due to additive gene effects and therefore selection may be effective for these characters.

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