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EFFECT OF IRRADIATION ON SEEDLING CHARACTERS IN BHINDI

Mutation breeding has paid rich dividends in several crop plants. An experiment was conducted in *bhindi* (*Abelmoschus esculentus* L. Moench) to study the effect of irradiation on seedling characters.

Uniformly dried seeds of the *bhindi* variety Pusa Sawani having a moisture content of 10 per cent were irradiated with X-rays and gamma rays at Coimbatore at the Agricultural College and Sugarcane Breeding Institute respectively. Three doses of X-rays (50, 75 and 100 KR) using a 50 KV philips X-ray machine delivering at 500 R per second with an applicator of 4/10 and four doses of gamma rays (50, 75, 100 and 125 KR) using a Co^{60} source with an emission potential of 1 kR in 15.1 seconds were employed. The irradiated seeds along with control were grown immediately after irradiation adopting a completely randomised design with a spacing of 60×15 cm. at the Agricultural College, Dharwar during June-October 1972. All the M_1 plants were selfed and each plant was harvested and the seeds were collected separately. Seeds of 100 plants selected at random in each treatment including control were grown in seed pans in the laboratory in a randomised layout with two replications. Data on germination, root and shoot length, length and breadth of first pair of leaves were recorded on fifteen days old seedlings in the M_1 and M_2 generations. The mean, variance and variance analysis have been worked out.

The variance analysis showed significant differences between treatments in M_1 and M_2 generations in respect of all the characters. The magnitude of reduction in germination was greater in M_2 than in the M_1 generation and gamma irradiated population showed lower germination (Table 1). In general there was no relation between the dose and the mean of any character. Either decrease or increase in mean values over the control was observed. However there was an increase in variance which indicates the release of new variability by irradiation. The reduction in characters such as seedling height in irradiated populations may be due to the inhibition of auxin synthesis (Gaur and Notani, 1960; Goud and Nayar, 1968). The irradiated plants have thicker and darker green leaves as compared to the control. The mean of the irradiated population either remains unchanged or is altered in the negative direction. The variance, in contrast, significantly increased (Scossiroli, 1965). The present findings are in agreement with this general trend.

Our sincere thanks are due to Dr. R. N. Kaw for arranging seed irradiation at Coimbatore.

Table 1

Mean and variance in M_1 and M_2 generations for seedling characters in bhindi

Source of Irradiation	Dose (KR)	Germination	Seedling height		Root length		Leaf length		Leaf breadth	
		(%)	Mean (cm)	Variance	Mean (cm)	Variance	Mean (cm)	variance	Mean (cm)	Variance
X-ray	0	94	16.71	16.51	3.63	7.73	2.50	1.00	2.40	0.66
	50	82* (86)*	14.35 (14.06)	15.22 (10.22)	4.16* (5.50)	19.31 (8.50)	2.44* (2.29)*	1.76 (1.05)	2.43* (2.22)*	0.85 (3.31)*
	75	90* (86)*	14.60 (14.86)	13.90 (12.22)	5.35 (5.14)*	18.03 (5.72)	2.66* (2.52)*	1.04 (0.56)	2.47* (2.45)*	1.34 (5.54)
	100	82* (80)*	15.03 (15.90)*	33.73 (17.90)	5.14 (8.20)	13.38 (35.60)*	2.28* (2.86)	3.68* (0.30)*	2.37* (2.75)	1.51 (0.33)
Co^{60}	50	78* (74)*	13.94 (14.50)	17.72 (25.00)	5.00 (5.05)	5.86 (5.23)	2.46* (2.46)*	1.24 (1.26)	2.26* (2.37)*	0.58 (0.72)
	75	76* (88)*	13.11 (13.07)	40.58 (9.22)	3.92* (5.71)	8.56 (10.45)	2.57* (2.61)*	0.85 (0.43)	2.38* (2.57)*	1.20 (0.28)
	100	66* (40)*	11.00* (12.89)*	18.50 (7.89)	3.56* (5.83)*	10.28 (11.00)	2.68* (2.63)*	1.10 (1.12)	2.58* (2.53)*	0.74 (0.76)
	125	38* (36)*	9.60* (11.25)	9.40 (22.75)	3.20* (5.00)	6.10 (3.50)	2.55* (2.30)*	1.15 (0.36)	2.44* (2.20)*	0.60 (0.16)

Upper and lower values relate to M_1 and M_2 generations respectively

* Significant at 5 per cent

സംഗ്രഹം

എക്സ്പ്രസ്സയുടെയും ഗാമാറേഡ്യുടെയും പ്രവർത്തനത്തിന് വിധേയമാക്കിയ വെണ്ടവിത്തു കളിൽ നിന്നും M_2 പരമ്പരകളിൽ വളരെയേറെ വൈവിധ്യം കാണിക്കുന്നതായി *ffirmglsrotsj*. അവ സാധാരണ ചെടികളിലേതിനേക്കാൾ കട്ടിയുള്ളതും കടുപച്ചനിറമുള്ളതുമായ ഇലകളോടുകൂടിയവയായിരുന്നു. തൈകളുടെ പൊക്കം തുടങ്ങിയ ചില സ്വഭാവങ്ങളിൽ അവ കൺട്രോൾ ചെടികളെക്കാൾ മോശമായും കണ്ടു.

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