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ROSETTE—AN INDUCED MUTANT OF BARLEY (*HORDEUM VULGARE* L.)

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In the course of mutation studies in barley, a rosette mutant was isolated. It was screened in M_2 generation of the cultivar HBL-98 following treatment with 10 kR gamma rays + 0.5% ethyl methanesulphonate. It was confirmed as mutant in M_3 generation. The mutant was named according to the most conspicuous character, i.e. spreading like grass in severe winter and bolting with rise in temperature. Besides, it was characterized by dark green, less waxy and delicate leaves. There was clustering of the lower internodes in early stages, resulting in rosette phenotype. This state was persistent till the end of February and as the temperature started rising, the compressed internodes of the mutant started elongating and attained normal growth like the control plants. The stem was thicker (6.9 ± 0.8 mm) than that of the parental line (6.0 ± 0.7 mm). The flowering and maturity were delayed by about a week (Table 1). There was no difference in the spikelets or grains/spike between the mutant and the parent strain. The rosette mutant was crossed with the parent line and five F_1 plants grown. However, only two plants survived till maturity. The F_2 was grown and screened for rosette character, which was easily distinguishable in the field. Genotypic segregation for rosette character was studied after screening the F_3 generation. These generations confirmed the recessive expression of rosette attribute (Table 2). This character was controlled by a pair of recessive allels.

Table 1. Comparative characters of the barley mutant and its parent strain

Character	Parent line	Rosette mutant
Plant height (cm)	88.7 ± 1.23	86.9 ± 1.08
Effective tillers/plant	3.8 ± 1.16	3.8 ± 1.27
Stem diameter (mm)	6.0 ± 0.68	6.9 ± 0.76
Penduncle length (cm)	13.7 ± 1.53	13.5 ± 1.25
Ear length (cm)	13.7 ± 1.53	13.5 ± 1.25
Spikelets/spike	96.1 ± 1.13	98.5 ± 1.25
Grains/spike	68.5 ± 1.83	71.4 ± 1.78
Days to flowering	121.4 ± 1.21	127.3 ± 1.03
Days to maturity	165.1 ± 0.98	175.1 ± 0.98

The genetic architecture of the mutant enables it to withstand the snow after germination, whereas the normal barley plants will be damaged. Hence it will be useful for cultivation in high and dry temperate hills of Northwestern Himalayas where barley is sown before

Table 2. Segregation for rosette mutant of barley in F_2 and F_3 generations

Cross	F_1 phenotype	F_2 behaviour			F_3 behaviour of normal F_2 plants*		
		normal plants	mutant plants	χ^2 for 3:1 ratio	segregating progenies (3:1)	true breeding	χ^2 for 2:1 ratio
HBL-98 x Rosette	Normal	144	53	0.362	101	43	0.781

*All progenies of the mutant F_2 plants bred true for the mutated trait.

the onset of winter and remains covered under snow and picks up growth after the snow melts with the rising temperature.