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Short Communication

Inheritance of lemon yellow leaf colour mutant in groundnut (*Arachis hypogaea* L.)

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Lack of sufficient variability is a major bottleneck in genetic improvement in groundnut (*Arachis hypogaea* L.) for both oligogenic and polygenic characters [1]. Induction of a wide range of variability through mutation breeding using chemical and physical mutagens to meet the future problems of crop improvement [2] associated with lack of variability for selection [3] and proper understanding of genetic regulation and organization [4] has well been described. The research on induced mutagenesis in groundnut with respect to frequency and spectrum of genetic variability created and inheritance of pattern of mutant characters have been reviewed [5-7]. In our recent studies on mutation breeding in groundnut [8-9] a few mutants affecting oligogenic and polygenically inherited characters have been identified. The inheritance pattern of one such mutant known as "Lemon Yellow Leaf Colour Mutant" (PBS 30017) is being reported here.

The lemon yellow leaf colour mutant (Fig. 1) was isolated in M_2 population of ethyl methane sulphonate (EMS 0.10%) treated groundnut cultivar, Girnar 1 (*Arachis hypogaea* L. ssp *fastigiata* var. *vulgaris*). The population size of M_2 generation of EMS 0.10% treatment was 6060 plants out of which the frequency of this mutant was 1.65×10^{-4}, it bred true in successive

Normal green leaf of Girnar 1 Lemon yellow leaf colour mutant

Fig. 1. Normal green leaf of Girnar 1 (left) and lemon yellow leaf colour mutant (right) of groundnut

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Table 1. Segregation of lemon yellow leaf colour trait in F_2 generation

Families	F_2 phenotypes			χ^2 (3:1)	P value
	Normal green leaf colour	Lemon yellow leaf colour	Total		
1.	58	15	73	0.77	0.5-0.3
2.	47	13	60	0.36	0.7-0.5
3.	76	20	96	0.89	0.5-0.3
4.	60	19	79	0.04	0.9-0.8
5.	30	11	41	0.07	0.8-0.7
6.	52	17	69	0.01	0.9-0.9
Pooled	323	95	418	1.15	0.3-0.2
Heterogeneity	-	-	-	0.98	0.95-0.90

M_3 and M_4 generations. The mutant trait started expressing from fourth to fifth leaf stage by producing lemon yellow leaflets and continued till maturity, resulting in lemon yellow appearance of the plant. The mutant is Spanish bunch (*Arachis hypogaea* ssp *fastigiata* var. *vulgaris*) in growth habit, dwarf in height (12-15cm height as compared with 35-40cm height of Girnar 1), with pods smaller than the parent (2.2cm as compared with 3.5cm of Girnar 1). It matures in 90 days i.e., 10-12 days earlier than the parent. The mutant was crossed with Girnar 1 as pollen parent in *kharif* season of 1997. The F_1 and F_2 generations were raised in *kharif* 1998 and 1999, respectively. The χ^2 test was applied to ascertain the segregation pattern.

All the F_1 plants showed normal foliage like Girnar 1 during the entire growth period indicating the recessive nature of the gene governing the yellow leaf colour mutant trait. The F_1 plants (30 numbers) were harvested individually. The produce of individual plant progeny was extremely low. Hence, to arrive at meaningful population size, 3-4 F_2 families were pooled together at random. The results of F_2 segregation are summarized in Table 1.

The F_2 segregation showed good fit to 3 (normal): 1 (lemon yellow) ratio. Hence, it could be concluded that the yellow leaf colour mutant is controlled by single gene. The gene symbol *Ly* (Green) and *ly* (lemon yellow) is being proposed for this mutant. The lemon yellow leaf colour trait can serve as a useful marker in genetic studies or linkage analysis. Inheritance studies of leaf colour in groundnut showed monogenic control for "deep green" *vs* "light green" [10-11] and digenic duplicate gene actions for "green" *vs* "chlorina" [12-13] and "green" *vs* "golden yellow" [14-15].

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