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Short Communication

Girnar 1 CLM — A new chemically induced curly leaf groundnut mutant

R. K. Mathur, P. Manivel, M. Y. Samdur and P. Paria

National Research Centre for Groundnut (ICAR), PO Box 5, Ivnagar Road, Junagadh 362 001

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A thorough knowledge on inheritance pattern of different characters is of utmost importance for plant breeders in formulation of sound and effective breeding programme, construction of linkage maps and to facilitate marker-assisted- selections. Though groundnut is an important oilseed crop, the genetic studies in this crop are meagre [1]. In view of this, a study was undertaken to understand inheritance pattern of curly leaf character of chemically induced mutant of groundnut.

Dry and uniform seeds of Spanish bunch groundnut (*Arachis hypogaea* ssp. *fastigiata* var. *vulgaris*) cultivar Girnar 1 were pre-soaked in distilled water for 12 hours. These seeds were treated with 0.01% diethyl sulphonate (DES) followed by 0.02% ethylmethane sulphonate (EMS) for four hours each. Treated seeds were washed thoroughly in running tap water for half an hour, air dried and sown in field at the National Research Centre for Groundnut, Junagadh (Gujarat). The M_1 generation was raised during kharif 1994 and succeeding M_2 and M_3 generations were handled in plant-to-progeny row method during kharif, 1995 and 1996, respectively. Out of 122 progenies evaluated in M_2, all plants of one progeny were having tip of the leaflets bending posteriorly giving a curly shape to the leaf (Plate 1). The mutant was characterized by a) small, curly and hairy leaves, b) Virginia bunch (*Arachis hypogaea* spp. *hypogaea* var. *hypogaea*) in growth habit, c) alternate branching, and d) profuse hairy stem and branches. The progenies of these plants were true breeding in M_3 and M_4 generations. This mutant was crossed as female with normal leafy parent (Girnar 1) used as pollen parent during kharif 1996. The F_1 and F_2 generations were studied during kharif, 1997 and 1998, respectively.

All the F_1 plants were having normal leaf shape indicating the recessive nature of curly leaf trait. The F_2 plants were harvested individually. To obtain optimum family size for χ^2 test, 7-8 progenies were bulked at random to construct one family. Thus, seven families were developed and χ^2 test was applied. In all the seven families, a good fit of 3 (normal leaf) : 1 (curly leaf) ratio was found. This indicated that a single recessive gene governed the curly leaf trait in question. Our study confirms the earlier report [2].

The mode of origin of curly mutant in the present study was a bit different. The M_1 was with normal leaf and assumed to be heterozygous for the mutant. How then in M_2 of that particular plant progeny became the homozygous for curly leaf is a matter of conjecture. The simplest explanation could be that at flowering the unaffected L^{cur} allele got altered to l^{cur} at the influence of mutagenic residue that creeped upto some stages of growth of that particular M_1 plant.

Table 1. The F_2 segregation of curly leaf trait in groundnut

Family	Phenotypes of F_1 plants	Number of F_2 phenotypes with			χ^2 value (3:1)	Probability range
		Normal leaves	Curly leaves	Total		
1.	Normal leaf	73	24	97	0.0034	0.75-0.90
2.	Normal leaf	86	27	113	0.0737	0.75-0.90
3.	Normal leaf	69	23	92	0.0000	0.99-0.95
4.	Normal leaf	85	27	112	0.0476	0.75-0.90
5.	Normal leaf	75	25	100	0.0000	0.99-0.95
6.	Normal leaf	63	21	84	0.0000	0.99-0.95
7.	Normal leaf	66	21	87	0.0.345	0.75-0.90
	Total	517	168	685	0.0822	0.75-0.90

It is not known whether the curly leaf trait studied earlier and the presently reported one is allelic. Therefore, it is safe to propose separate gene symbol for presently studied induced mutant as l^{cur} l^{cur} (curly leaf) and L^{cur} L^{cur} (normal leaf).

References

1. **Murthy T. G. K. and Reddy P. S.** 1993. Cytogenetics and genetics of groundnut. Oxford and IBH, New Delhi.

2. **Branch W. D.** 1987. Inheritance of a curly-leaf shape in groundnut. J. Heredity., **78**: 125.