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# INHERITANCE OF MULTIPINNATE LEAF TYPE IN CHICKPEA (*CICER ARIETINUM*)

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## ABSTRACT

**A spontaneous mutation of the chickpea cultivar K-850 is reported. The mutant had multipinnate leaf. The inheritance of this mutant was studied in $F_1$ and $F_2$ generation of the crosses involving K-850, HYb 16-3 and JG-62 with normal leaf. In the cross Mutant x K-850, $F_3$ generation was also studied. The segregation patterns of these crosses suggested that the mutation is monogenic recessive.**

**Key words:** Chickpea, *Cicer arietinum*, multipinnate leaf, genetics.

In chickpea, the normal leaf is compound imparipinnate. We observed a variant with multipinnate leaf. The inheritance of this spontaneous leaf variant is reported.

## MATERIALS AND METHODS

From a total population of the variety K-850 of 1280 plants in a trial, a plant with multipinnate leaf was observed (Fig. 1). The plant also had shorter internodes. Subsequent progeny tests confirmed that it was a true breeding mutation.

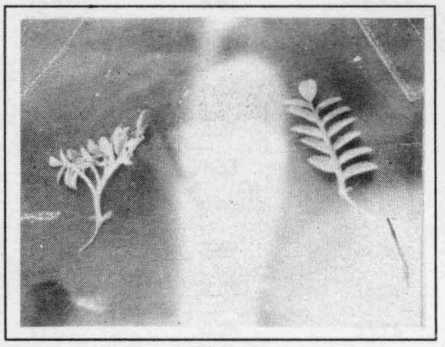

**Fig. 1.**

Important characteristics of the mutant and the mother parent, K- 850, are given in Table 1.

## RESULTS AND DISCUSSION

The mutant was crossed with the varieties K-850, Hyb 16-3 and JG- 62 having wild type (normal) leaves. The $F_1$ plants of all the crosses were normal (Table 2), and the $F_2$ generation segregated into 3 normal : 1 mutant, suggesting

that the mutant phenotype is inherited as a monogenic recessive trait. This was also confirmed by the segregation pattern observed in the $F_3$ progenies of the cross Mutant x K-850. Out of the 19 $F_3$ progenies, 5 and 6 were nonsegregating normal and mutant type, respectively, and 8 segregated for leaf type. The segregation in the $F_3$ generation showed a good fit in a 1 : 2 : 1 ratio, confirming the $F_2$ results. The eight segregating progenies showed segregation into 3 normal: 1 mutant.

**Table 1. Important characteristics of the multipinnate mutant and the parent cultivar K-850 of chickpea**

| Character | K-850 | Mutant |
|---|---|---|
| Days to flower | 74.0 | 78.0 |
| Plant height (cm) | 52.6 | 48.3 |
| Internode length (cm) | 1.8 | 1.3 |
| Primary branches/plant | 5.5 | 5.2 |
| Pods/plant | 64.0 | 51.5 |
| Hundred-seed weight (g) | 30.4 | 28.9 |
| Yield/plant (g) | 14.6 | 12.8 |
| Seed colour | Reddish brown | Reddish brown |

Pundir et al. [1] reported a similar mutant in chickpea.

**Table 2. Inheritance of multipinnate leaf mutation of chickpea**

| Cross | Generation | Observed segregation | | | Expected ratio | $\chi^2$ | P |
|---|---|---|---|---|---|---|---|
| | | normal | segregating | multipinnate | | | |
| Mutant x K-850 | $F_1$ | 2 | — | — | — | — | — |
| | $F_2$ | 13 | — | 6 | 3 : 1 | 0.158 | 0.70–0.50 |
| | $F_3$ | 5 | 8 | 6 | 1 : 2 : 1 | 0.237 | 0.90–0.80 |
| Hyb 16-3 x Mutant | $F_1$ | 8 | — | — | — | — | — |
| | $F_2$ | 280 | — | 104 | 3 : 1 | 0.888 | 0.50–0.30 |
| Mutant x JG 62 | $F_1$ | 11 | — | — | | | |
| | $F_2$ | 212 | — | 77 | 3 : 1 | 0.416 | 0.70–0.50 |

## REFERENCE

1. R. P. S. Pundir, M. H. Mangesha and K. N. Reddy. 1990. Leaf types and their genetics in chickpea (*Cicer arietinum* L.). Euphytica, **45**: 197–200.