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MORPHOLOGICAL VARIATIONS IN MUNG (*PHASEOLUS AUREUS*) INDUCED BY GAMMA IRRADIATION

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Morphological variations in crop plants are very common following exposure to ionizing radiation. The normal expression of plant parts, i.e. leaves, roots, stems and flowers are often altered by radiation. Such morphological variations have been reported by many workers.¹⁻³ There seems to be no literature as yet on radiation induced abnormalities in *Phaseolus aureus* although such abnormalities have been reported in other plants. During the course of investigations to produce beneficial mutants in mung crop interesting morphological changes have been noticed, a preliminary report of which is given here.

Seeds of two pure varieties of *Phaseolus aureus* namely, 6601 and 6602 were exposed to acute gamma radiation with dosages ranging from 10-40 kR, from 13,000 Curie⁶⁰ Co source. Irradiated seeds were directly sown in the field 10 days after irradiation.

The abnormalities were noted at pod formation stage. In variety 6601 at 15 kR dose three plants were observed with stunted plant growth having rough, leathery and crinkled leaves (Plate 1).

Another abnormality observed in variety 6602 at 40 kR dose was a hexafoliolate instead of the trifoliolate leaves (Plate 2).

Formation of leaf clusters in floral position was also observed in variety 6602 at 10 kR dose (Plate 3).

This type of morphological anomalies in vegetative as well as in reproductive parts have also been reported in jute,⁴ in *Tradescantia paludosa*,^{2,3} and in sunflower.⁵



Plate 1

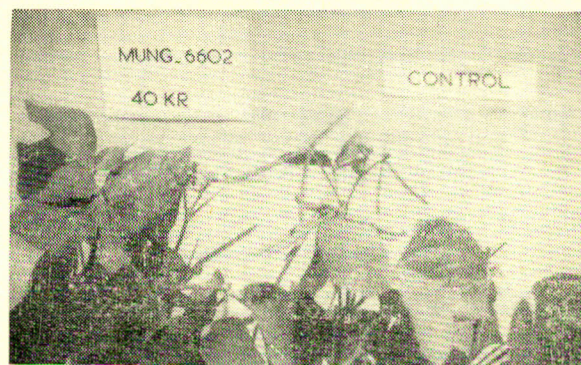


Plate 2

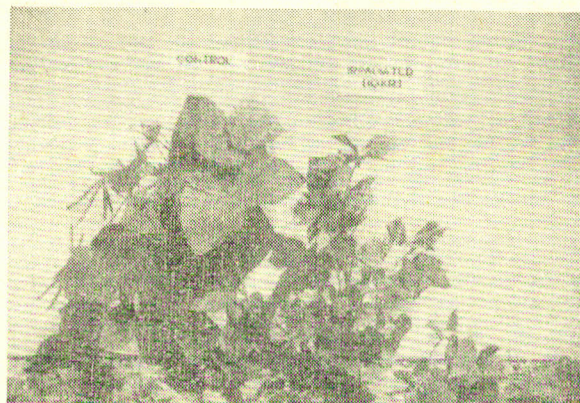


Plate 3

These phenotypic abnormalities in *Phaseolus aureus* seem to be manifestation of physiological disturbances of the cell materials caused by radiation. The tendency of leafy growth rather than to flower formation supports the previous theories that flower is a modified shoot. It, however, raises interesting physiological questions to which yet there are no satisfactory answers.

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References

1. G.S. Sethi and K.S. Gill, *Radiation Botany*, **9**, 415 (1969).
2. J.E. Gunckel, I.B. Morrow, A. H. Sparrow and E. Christensen, *Bull. Torrey Botan. Club*, **80**, 445 (1933).
3. J.E. Gunckel, A.H. Sparrow, I. B. Morrow and E. Christensen, *Am. J. Botany*, **40**, 317 (1953).
4. M.M. Mia and S.M. Ali, *Effect of Gamma Radiation on Jute-morphological Variations in the First Generation Plants*. 17th Pakistan Sci. Conf. Proc. (1965), p. 16.