

**Table 1** Effect of gamma rays on morphological characters in *Solanum americanum* Mill. and *Solanum villosum* Mill.

Dose	Generation	Mean plant height in cm		Mean number of branches		Mean number of leaves	
		<i>S. americanum</i>	<i>S. villosum</i>	<i>S. americanum</i>	<i>S. villosum</i>	<i>S. americanum</i>	<i>S. villosum</i>
Control	R <sub>1</sub>	33.33 ± 0.32	36.00 ± 0.35	4.60 ± 0.42	10.00 ± 0.48	6.00 ± 0.91	11.50 ± 0.43
	R <sub>2</sub>	34.50 ± 0.37	36.77 ± 0.39	5.00 ± 0.38	10.50 ± 0.51	6.20 ± 0.82	12.00 ± 0.55
5 kR	R <sub>1</sub>	34.85 ± 0.61	42.50 ± 0.62	5.30 ± 0.65	12.00 ± 0.39	8.18 ± 0.69	13.42 ± 0.71
	R <sub>2</sub>	38.12 ± 0.55	43.00 ± 0.67	5.85 ± 0.38	13.00 ± 0.31	9.53 ± 0.72	13.90 ± 0.80
15 kR	R <sub>1</sub>	45.00 ± 0.71	40.00 ± 0.72	9.75 ± 0.70	11.00 ± 0.50	12.10 ± 0.32	13.00 ± 0.49
	R <sub>2</sub>	48.31 ± 0.62	40.85 ± 0.78	10.00 ± 0.82	12.10 ± 0.59	13.00 ± 0.47	13.40 ± 0.57
25 kR	R <sub>1</sub>	43.33 ± 0.90	41.00 ± 0.91	8.75 ± 0.27	13.00 ± 0.72	11.56 ± 0.61	14.00 ± 0.52
	R <sub>2</sub>	46.88 ± 0.48	41.75 ± 0.68	9.20 ± 0.32	13.75 ± 0.83	12.00 ± 0.63	14.40 ± 0.58
35 kR	R <sub>1</sub>	31.66 ± 0.72	34.67 ± 0.57	5.10 ± 0.45	10.45 ± 0.61	7.70 ± 0.23	11.70 ± 0.71
	R <sub>2</sub>	33.72 ± 0.63	35.70 ± 0.62	5.35 ± 0.62	10.60 ± 0.68	8.00 ± 0.39	12.15 ± 0.34

± = Standard error.

all the morphological parameters in both the species. The magnitude of stimulation was relatively better in the case of *S. americanum* than *S. villosum*.

Studies on the mutagenic effects on vegetative characters of diploid and related polyploid systems are rather scanty. The effect of X-rays and fast neutrons on 2X, 4X barley and 2X, 4X and 6X wheats has earlier been studied<sup>11</sup>. A gradual reduction in height in 2X, 4X and 6X wheats with an increase of X-ray dosage has been recorded. An appreciable difference in the height of the diploid and tetraploid barley up to 1 kR and a gradual reduction thereafter has been indicated.

A significant variation in shoot length on account of gamma ray treatment in diploid *Phalaris* than that of tetraploid has been very well recorded<sup>12</sup>.

The present results reveal a better range of values for all the parameters induced by gamma rays in *S. americanum* Mill. than that of *S. villosum* Mill. It can therefore be inferred that the latter species of Solanaceae has gone a long way in the course of evolution in acquiring substantial radio-resistance and tolerance than the former. The differential expression of radiosensitivity on the part of *S. villosum* Mill. could be a natural consequence of its multiple genomic make-up.

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## METHYL ISOCYANATE: A MUTAGEN

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METHYL isocyanate (MIC: CH<sub>3</sub>NCO), one of the most hazardous gaseous environmental pollutants poses a serious threat to plants and animals. It is a strong/potent mutagen and carcinogen<sup>1</sup> affecting the taxonomic diversity and productivity of plants and causing alterations in various physiological and

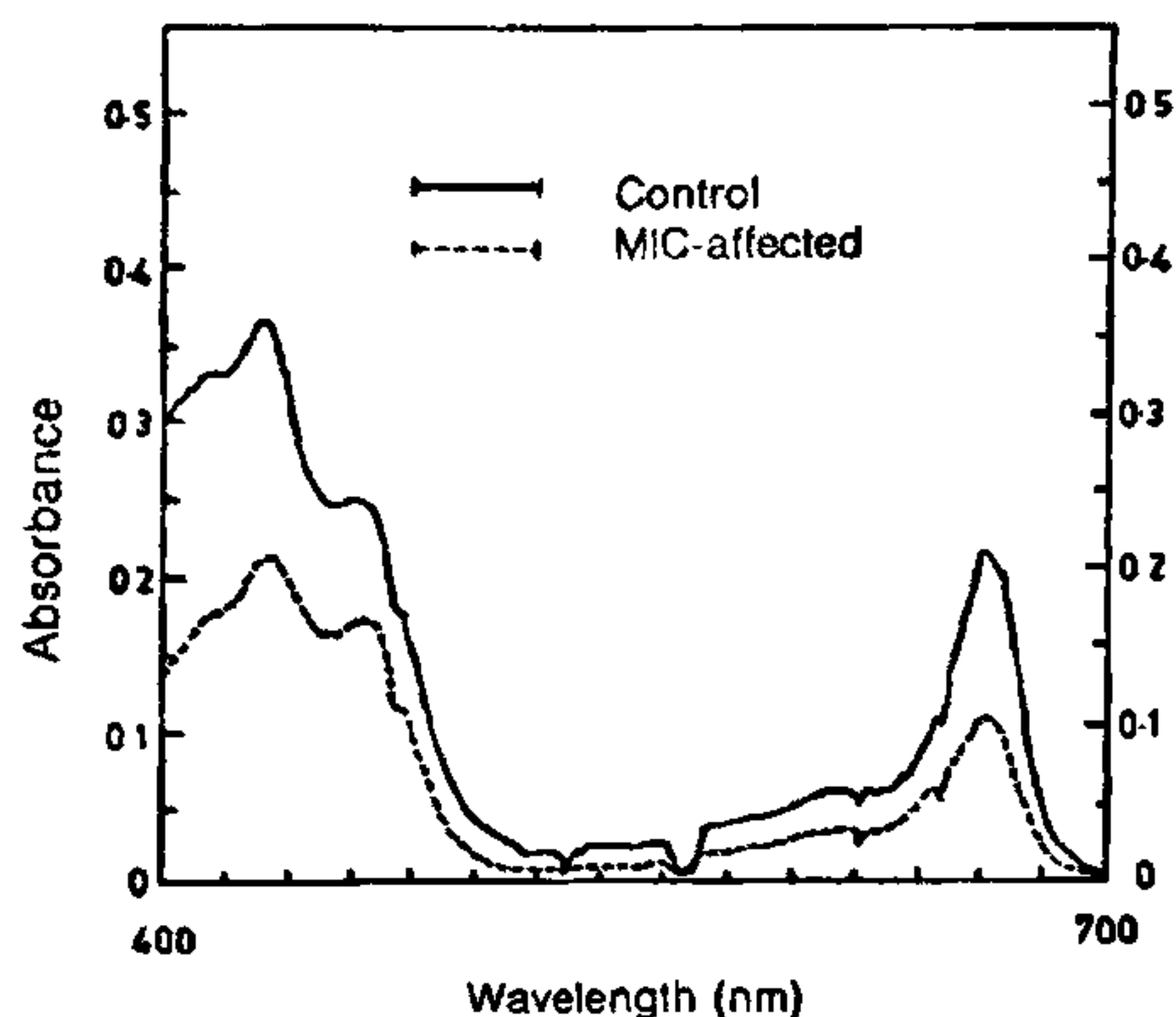


Figure 1. Chlorophyll contents of MIC-affected and control prothalli of *T. augescens*.

biochemical processes through intercalation of base pairs. While the first property leads to mortality, the latter may constitute some interesting departures from the normal form and structure of the organism.

A few fern leaves sagging up due to exposure of MIC leaked from the Union Carbide Factory on 2nd December 1984, were collected from a private garden in Bhopal. The spores from these leaves were tapped out, cultured in the laboratory and maintained at  $24 \pm 2^\circ\text{C}$ , on nutritive agar gel plates<sup>2</sup>. A couple of plates of the same species growing in the botanical garden of this University served as control. To estimate the chlorophyll content 20 mg of fresh weight of 19-day-old (2-D spatulate) MIC-affected and control prothalli were used. Chlorophyll was extracted in 5 ml 80% acetone, centrifuged and the absorbance recorded using a spectrophotometer (Perkin Elmer Lambda 3) in the visible range.

Most of the control spores of *Thelypteris augescens* germinated within 4 days, showing 90% germinability. But MIC-affected spores showed both delayed germination and lower germinability at 41%. The latter also gave rise to some aberrant gametophytes<sup>1</sup>. The chlorophyll contents were markedly decreased in comparable stages of control prothalli (figure 1) suggesting that MIC had also affected the chlorophyll synthesis. This inhibition could be genic, as MIC leakage occurred during the sporulation period of the material. It can therefore be concluded that MIC at mild doses acts as a powerful mutagen.

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#### A NEW REPORT ON ABNORMALLY FAST GERMINATING SEEDS OF *HALOXYLON* SPP.—AN ECOLOGICAL ADAPTATION TO SALINE HABITAT

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*HALOXYLON RECURVUM* (Moq.) Bunge ex Boiss. and *H. salicornicum* (Moq.) Bunge. are the two characteristic halophytes of the Indian desert; the latter is found even on sandy saline soil. An extremely fast germination in the seeds of these two species, commonly occurring within an hour is being reported for the first time in any Indian plant species. An ecological adaptive role is assigned to such a fast phenomenon of germination, which appears like uncoiling of the young embryo out of the testa immediately after contact with water. An unusually high rate of cell division and cell elongation, soon after imbibition appears to be the cause for such an unusual feature.

A variety of germination mechanisms in the seeds in relation to the characteristic habitat of the Indian desert have been reported<sup>1</sup>. A few reports on the seed germination of saline plants of this area are also on record<sup>2, 3</sup>, but a rapid germination has not been observed in any species. The establishment of a seedling under uncongenial conditions of salinity (physiological drought) or absence of moisture (physical drought) is possible, only if a seedling grows with a rapid rate to make use of a brief period of water availability, with lesser salt concentration.

Members of the series *Curvembryae* and family *Chenopodiaceae*, prominent genera among them, like *Atriplex* and *Haloxylon* are fairly common