A CASE OF TERMINAL CHROMOSOME DELETION IN *GLORIOSA SUPERBA* L.*

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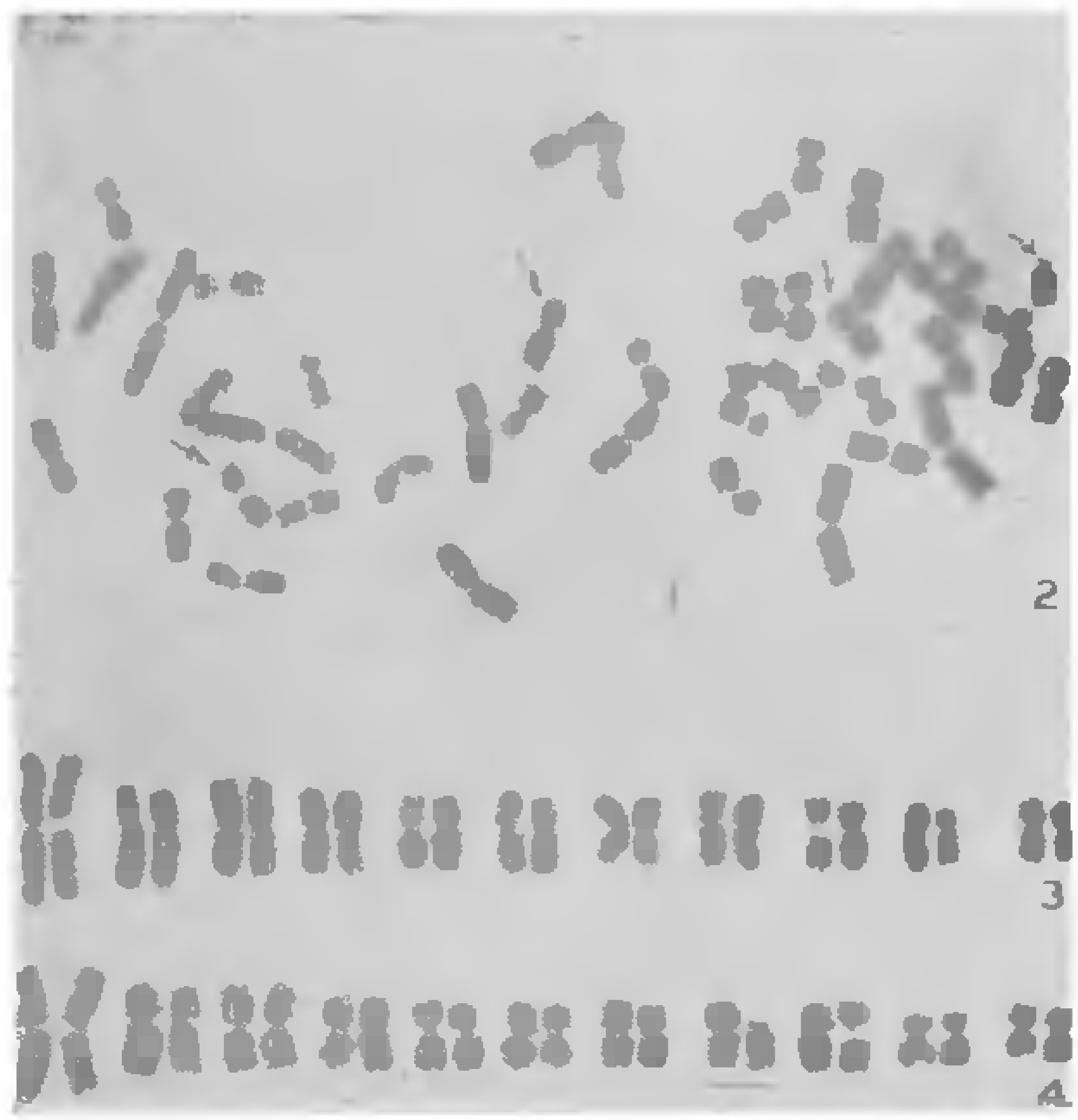
SOMATIC complement of *Gloriosa superba* consists of 22 chromosomes, out of which 2 are long 4 short and 16 comparatively medium in size. The basikaryotype is composed of 8 with median and 14 with submedian chromosome (8V + 14L, Narain[3]). Out of the latter 2 are nucleolar, being regularly associated with satellites on the shorter arms (Figs. 1 and 3). However, in one plant of *G. superba* (Vou. specimen no. 3/10), one of the submedian chromosomes in distinctly subterminal and the karyotypic formula is 8V + 13L + 1J (Figs. 2 and 4). An analysis of the photo-idiograms (Figs. 3 and 4) reveals that the subterminal chromosome has originated by deletion of the terminal portion of the shorter arm of this chromosome. Since the somatic chromosomes of *G. superba* are fairly long, the data on L/B ratio of the different chromosomes could be obtained with reasonable exactitude (Table I).

Thus *G. superba* (Vou. specimen no. 30/10) is a heterozygote, having arisen due to terminal deletion in a small submedian chromosome and the deletion was followed by healing of the broken end. Such deletions have been recorded in some genera of the flowering plants, *viz.*, *Aloe*[4], *Haworthia fasciata*[2], etc. Lea[1] induced chromosomal aberrations in a number of plants after irradiation experiments.

Chromosomal deletions, usually cause loss of the genetic material and are expected to have deleterious effects on the organisms. The extent of the loss would greatly depend upon the amount of the genetic material and the specific functions connected with this region. In higher plants, it often causes pollen and ovule sterility as it acts as gametophytic lethal[4]. However, in the present cultivar, there was apparently no morphological deformity in any part of the plant except that the taxon was sexually sterile and produced inviable pollen grains and seeds after both self and cross pollinations. There were no morphological abnormalities associated with this deletions and it seems that the adverse effects were balanced by the other homologous partner carrying the full complement of the genes.



FIGS. 1–4. Figs. 1–2. Somatic complements $2n = 22$) of the normal and structural heterozygote of *G. superba*, respectively. Arrows point to the nucleolar chromosomes × 1,200. Figs. 3–4. Photo-idiograms of normal and structural heterozygote, respectively. Note the heterozygous pair VIII in the latter.

TABLE I

Basikaryotypes of normal and structural heterozygote of G. superba *L.*

Taxa $2n = 22$	Chromosome types L/B ratio										
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI
G. superba	1·0	1·6	1·0	1·1	1·25	1·2	1·0	1·26	1·2	1·66	1·0
	V	L	V	L	L	L	V	L	I	L	V
G. superba	1·0	1·33	1·0	1·28	1·3	1·5	1·0	1·421 5·0	1·31	1·6	1·0
(Structural heterozygote)	V	L	V	L	L	L	V	L–J	L	L	L

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EFFECT OF IONIZING RADIATION ON EPIDERMAL TISSUES AND SECONDARY XYLEM IN *SOLANUM MELONGENA* L. CV. PUSA PURPLE LONG

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Considerable amount of work has been done on the effect of ionizing radiation on epidermal tissue[1,2,4]. Our knowledge regarding the effect of radiation on secondary xylem is rather meagre. Therefore, the present investigation was undertaken to find out the effect of ionizing radiation on epidermal tissues and secondary xylem in *Solanum melongena* L. cv. Pusa purple long.

The dry seeds of *Solanum melongena* L. cv. Pusa purple long were subjected to gamma irradiation at dosage levels of 5, 10, 20, 30, 40 and 45 krad. The irradiated seeds were sown in pots filled with 1:1 mixture of soil and farm yard manure. The peelings from leaves from 60 day old seedlings were obtained following the technique of Leelavathi and Ramayya[3]. The small pieces of stem were boiled in 40-50 % HNO_3 for maceration. The individual elements of vessel and fibres were measured. The average length of vessel and fibres and width of the vessel were calculated from the readings obtained on 500 randomly selected elements of each category from each sample.

The number of stomata per unit area was 52 (maximum) in control and it decreased with the increase in the intensity of gamma irradiation and reached only 38 (maximum) in 45 krad (Fig. 1). The stellate type of trichomes borne on the epidermis of leaves show a reverse trend. The number of trichomes per unit area was 18 (maximum) in control and showed an increasing trend from lower to higher doses and was 32 (maximum) in 45 krad (Fig. 1).

The length and width of the vessel measure 370 μ and 15 μ respectively in control, while in the irradiated plants, they show a decreasing trend from lower to higher doses. In 45 krad, the length and width of vessel measure 273 μ and 8 μ respectively (Fig. 1). The fibre length measures 467 μ (maximum) long in control, while it decreases with the increase in the irradiation and measures 350 μ (maximum) in 45 krad (Fig. 1).

From our results it may be concluded that the irradiated plants exhibit reduction in size of vessel elements and fibre length in secondary xylem. This reduction in length and width of vessel elements affects water conduction adversely. Consequently to check the transpiration rate, the number of stomata per

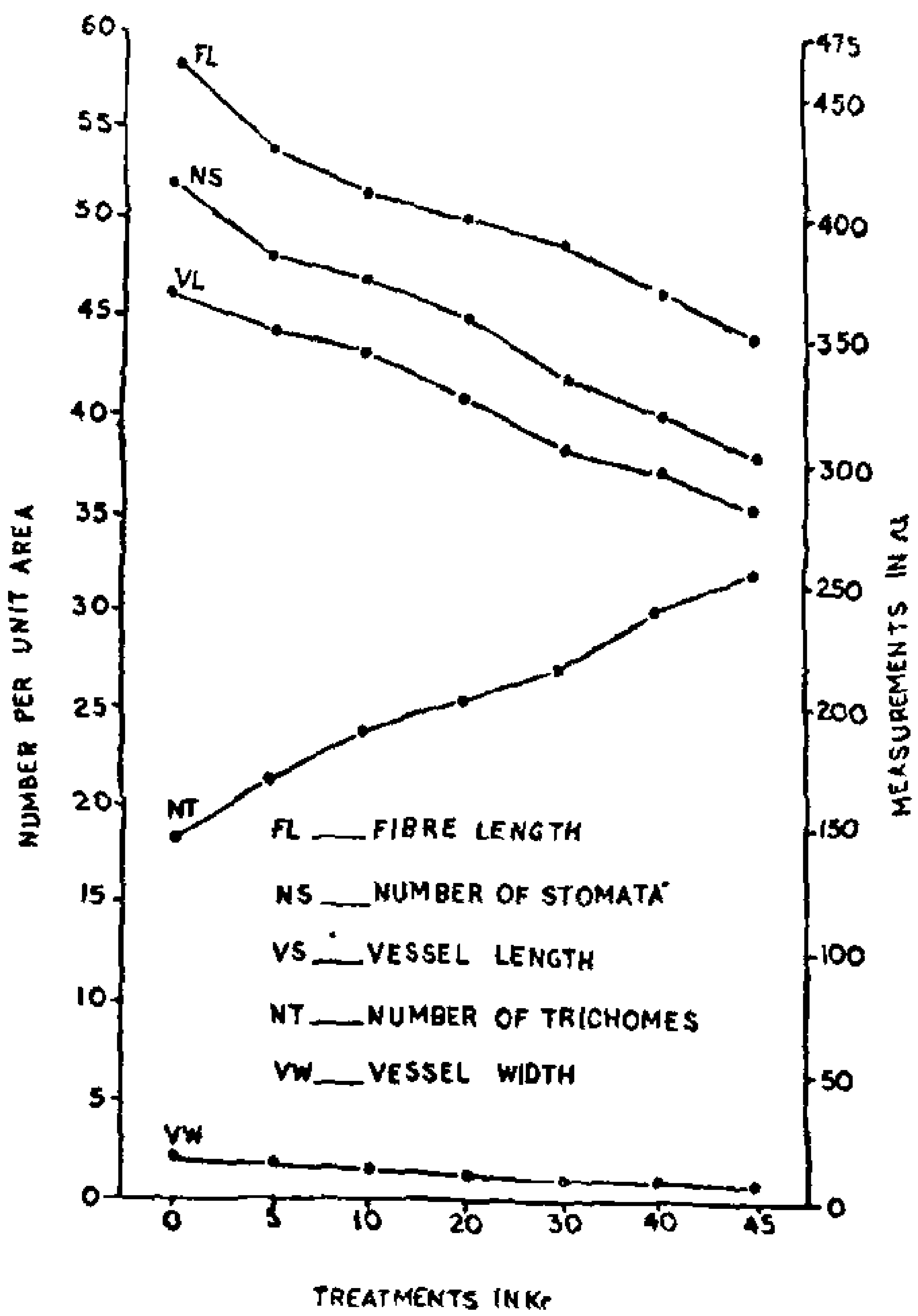

Fig. 1. Effect of gamma irradiation (5-45 krad) on number of stomata and trichomes, size of the vessel element and fibre length in *S. melongena* L. cv. Pusa purple long.