

indicated a total damage of 60% of the seeds. In view of the ability *C. mexicanus* to maintain a steady population in this weed host *Chloris barbata*, the possibility of a very heavy build up in *Pennisetum* ears cannot be overlooked. Further work in this direction is in progress.

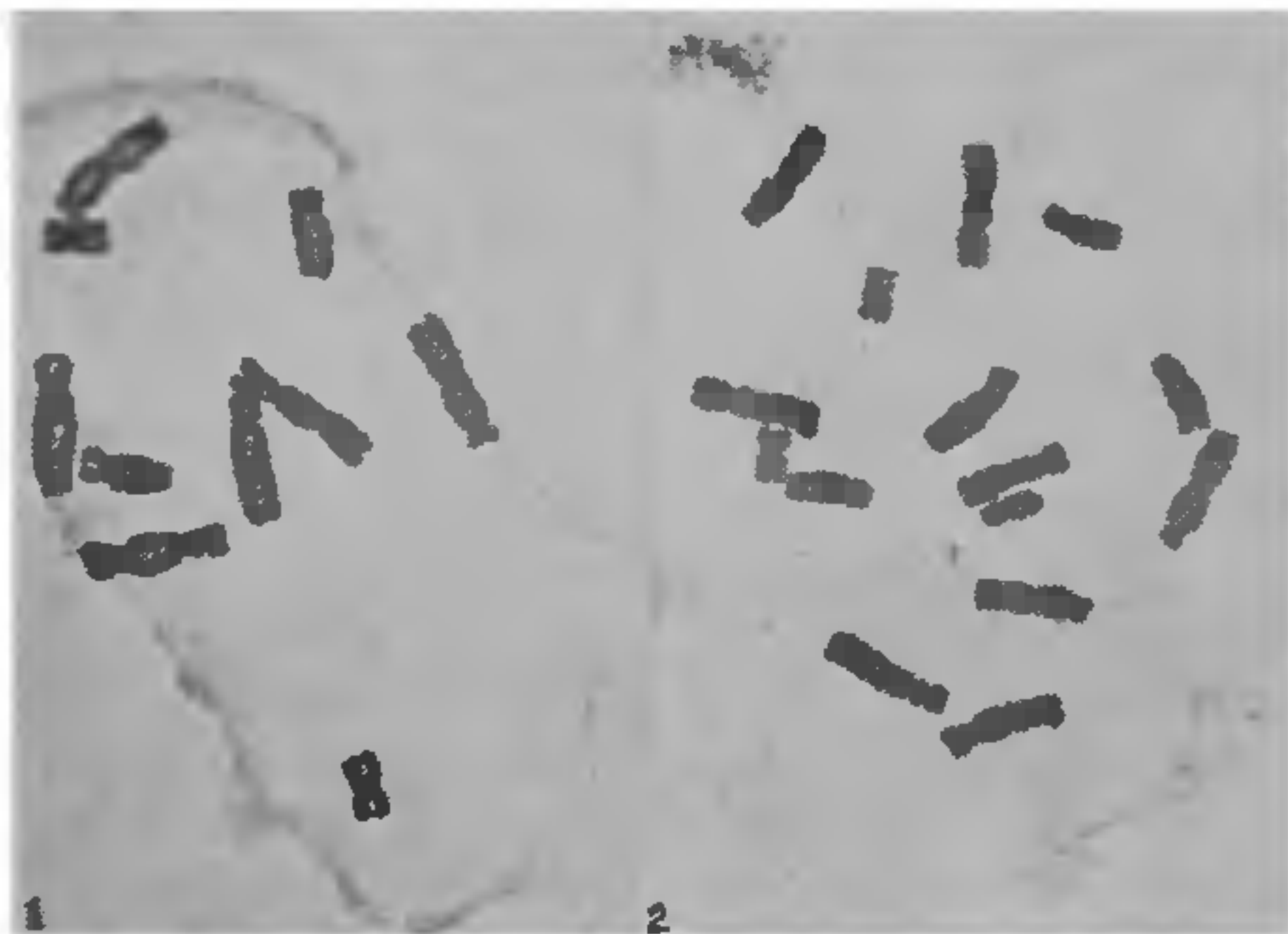
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CHROMOSOMES OF DIPLOID AND TRIPLOID *PUSCHKINIA LIBANOTICA* L.

Puschkinia libanotica L. (Fam. Liliaceae) has got five pairs of easily distinguishable chromosomes (Fig. 1). So far no heterochromatin has been detected in these chromosomes⁷. A few triploids were identified for the first time in *Puschkinia* (Fig. 2). Triploids appeared in the population with extremely low frequency. Of 2000 bulbs scored only 9 triploids without B chromosomes were isolated. Their chromosome length, chromosome volume, chromosome mass and DNA content were estimated and compared with diploids (Table I).



FIGS. 1-2. Fig. 1. Chromosomes of *Puschkinia*; $2n=10$ (\times ca. 2,300). Fig. 2. Triploid in *Puschkinia*; $2n=15$ (\times ca. 2,000).

TABLE I

Chromosome length and volume, chromosome mass and DNA content

	Total chromosome length (micron)	Total chromosome volume (cubic micron)	Chromosome mass ² ($\times 10^{-11}$ gm)	DNA content ³ (arb. unit)
Diploid	71.59	191.64	19.37	18.03
Triploid	110.79	290.56	29.73	27.24

1. Chromosome volume measured at metaphase from 40 well spread cells (Figs. 1, 2) considering chromatids as cylindrical in form.

2. Chromosome mass = Total dry mass - nucleolar dry mass; estimates were made by interference microscopy (Davies²) in 40 2C nuclei isolated from root tips following the method of McLeish⁴.

3. DNA content estimated by Feulgen photometry (McLeish and Sunderland⁵ using Barr and Stroud Integrating Microdensitometer. 40 2C nuclei were estimated.

These characters in triploids showed a proportionate increase at a constant rate of 1.5 times as compared to diploids. This indicated that there was no change in chromosome length, chromosome volume, its mass and DNA content consequent to polyploidy. It was therefore, concluded that no chromosome re-organisation took place during the process of polyploidisation. On the other hand, several genera of Liliaceous family such as *Trillium*, *Fritillaria* and *Paris* showed diminution of chromosome size¹, where the chromosomes are characterised by significant amount of heterochromatin. La Cour's³ observations in *Trillium tschonoskii* are also significant, where reduction of heterochromatic segments was noted in tetraploids. In the light of present observations it can be suggested that the effect of polyploidy is different in chromosomes with heterochromatin from those without.

Sharma⁶ also observed no variation in chromosome size in tetraploids of *Vicia sativa* where no significant amount of heterochromatin was observed in the chromosomes of diploids. *V. faba* on the other hand having prominent heterochromatic segments in diploids, showed significant difference in chromosome size in polyploids. From the present comparison, it therefore follows, that species where diploids do not have any significant amount of heterochromatin may not show any difference in chromosome size at increased level of ploidy.

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KARYOTYPE IN THREE CULTIVATED VARIETIES OF *GLYCINE MAX* (L.) MERR.

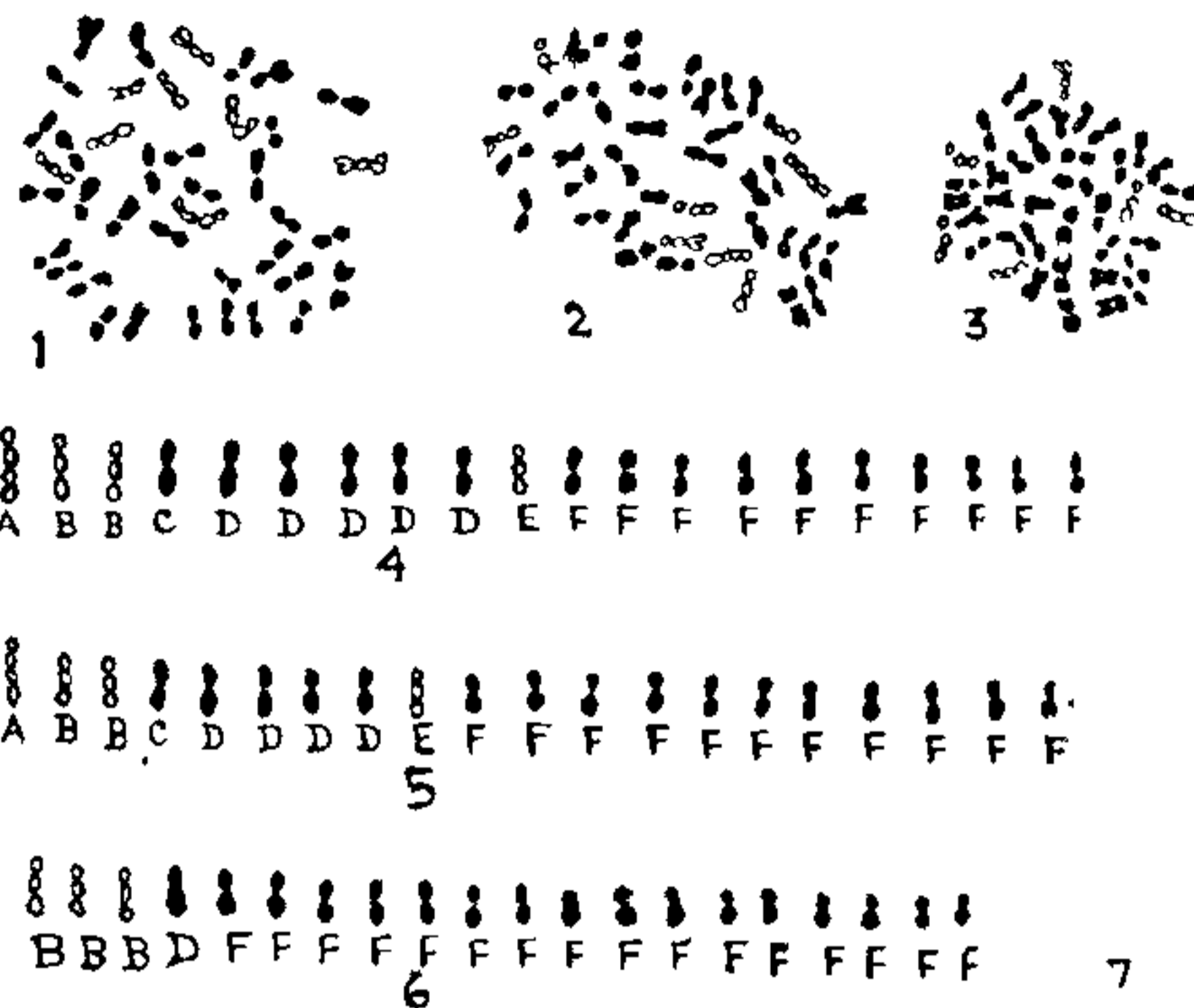
Glycine max (L.) Merr. commonly known as soya-bean, is cytologically not adequately explored^{3,4,5}. A thorough analysis of karyotype was made only recently in the cultivated variety UPI in *G. max*¹. In this investigation a comparative study has been made on the detailed cytology of UPI, Improved Pelican and Mammoth. Somatic chromosomes were studied from young root-tips after pre-treatment in saturated paradichlorobenzene solution at 15°C for 2.5 hours and fixation in acetic-alcohol (1:2) for 30 minutes followed by hydrolysis in 2% aceto-orcin NHCl (9:1) solution and finally squashing in 1% aceto-orcin solution. Somatic complement in this species has been found to consist of forty chromosomes (Figs. 1, 2, 3, 7). Secondary constrictions were observed in three to four pairs of chromosomes. The longest pair was provided with supernumerary constrictions. In all the varieties the karyotype was graded and the following morphological types have been observed (Figs. 4, 5, 6).

Type A—Represented by comparatively long chromosomes, each with three constrictions, one primary and the other two secondary. Of these, one was nearly median in position and the other two located in submedian positions at the two ends.

Type B—Represented by medium-sized chromosome each with two constrictions, primary and secondary. One of the constrictions was submedian in position and the other was nearly median to submedian to the longer arm.

Type C—Nearly long chromosomes each with median to nearly median primary constrictions.

Type D—Medium sized chromosomes of slightly ranging length each with submedian primary constrictions.



FIGS. 1-3. Somatic metaphase in varieties UPI, IP and Mammoth respectively ($2n = 40$), $\times 2,100$.

FIGS. 4-6. Idiogram in UPI, IP and Mammoth respectively.

FIG. 7. Photomicrograph ($2n = 40$) in UPI.

Type E—Medium-sized chromosomes each with a primary and a secondary constriction. One of them was submedian in position and the other was nearly median to the longer arm.

Type F—Medium sized to short chromosomes of varying sizes, each with nearly median to submedian primary constrictions.

In the variety UPI, the chromosomes were short to medium-sized ranging from $1.5-3.2 \mu$, four pairs of them had secondary constrictions and the longest pair having supernumerary constrictions (Figs. 1, 4). All the six morphological types were present in this variety. Two pairs of chromosomes represented type B, one pair of them was comparatively long. Type D was represented by five pairs of chromosomes, two pairs had nearly submedian and three pairs had nearly median primary constrictions. The chromosomes in the variety Improved Pelican were mostly similar to those in the variety UPI having the size range between $1.4-2.4 \mu$. One pair of chromosome resembled type A but one of the constrictions was located at the distal end. The somatic chromosome complement in the variety Mammoth was quite different from that in the other two varieties; chromosome size in this variety varied from $1.3-2.3 \mu$. Types A, C and E are absent but B was represented by three pairs of chromosomes, of which one pair was provided with a very short secondary constriction at the distal end of the longer arm. Total amount of chromatin content per haploid complement was 41.4μ in the variety UPI, 37.4μ in Improved Pelican and 36.1μ in Mammoth.