

5. Somatic mutation to B'.

Evidence from plants bearing sectors with new B' mutations shows that mutation can occur in B B or B b tissues, that B' is largely or completely cell-limited, and that conversion can occur well after tassel-branch differentiation, though it may not be restricted to late stages.

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6. Meiosis in haploids.

Agreement was found with the well-documented pattern of pairing and chromosome behavior typical of haploids in general and of maize haploids in particular (see review by Kimber and Riley, Bot. Rev. 1963) in meiosis of four haploids. Unexpectedly, however, a normal-appearing organized nucleolus was present in almost all microspore nuclei, whether small or large, even when a quintet or more of spores was formed. The meiotic behavior of the haploid microspore mother cells resulted in typical conspicuous shortages of chromatin in the spores and can be assumed to have produced only two chromosomes 6 for distribution among the spore set from each mother cell. Whether this unexpected nucleolus formation is unique to haploids of this origin (Coe's stock 6), or is a general phenomenon, an explanation is not immediately apparent.

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1. A scheme for simultaneous detection of nondisjunction, nonreduction and androgenesis.

In order to obtain information about factors involved in these phenomena from the same set of experiments, the following scheme has been adopted.

Ears of plants of the constitution A₁ sh₂/a₁ SH₂ subjected to various experimental conditions are pollinated by pollen from plants homozygous for a₁ and sh₂. Results expected under different situations are given below.

Phenotypes of kernels	Probable events	Remarks
1. <u>a₁ Sh₂</u>	(a) nondisjunction of chromosome 3, (b) nonreduction of eggs, (c) mutation	These can be distinguished by chromosomal counts.
2. <u>a₁ sh₂</u>	(a) androgenesis, (b) mutation	Examination of parental traits is necessary.

Phenotypes of kernels	Probable events	Remarks
3. $A_1 \underline{sh}_2$ or $a_1 \underline{Sh}_2$	normal meiosis, gametogenesis and fertilization not involving any of these phenomena (nondisjunction, non-reduction and androgenesis)	

Since any one of the ten chromosomes has an equal chance of being involved in nondisjunction, only one-tenth of all nondisjunctional events can be detected by this method. However, the method will be useful for comparative studies of effects of different factors on this phenomenon.

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2. A search for the sugary phenotype in Orissan maize.

As a part of a program for breeding sweet corn suitable for the maize-growing tracts of Orissa--an eastern state of India, samples of maize collected from different parts of the state have been screened to isolate, if possible, sugary mutants from the local varieties.

A few sugary kernels have been found on two ears from two different places, out of the present collection comprising more than 500 ears mostly from hilly districts.

The search is being further extended and the breeding potential of these few seeds at hand is being tested.

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3. Cytogenetic studies of maize varieties of Orissa.

Studies along the following lines have been undertaken in maize collected from different parts of Orissa: (a) pachytene analysis for cytological characterization of varieties; (b) change in chiasma frequency consequent upon selfing; (c) study of meiosis to detect any evidence for chromosomal aberrations, if involved in varietal differentiation; (d) search for the presence of genes affecting meiosis and gametogenesis; (e) embryological studies to assess as far as possible the extent of teosinte-introgression and other interesting peculiarities, if any.

Amongst the results obtained, mention may be made of evidences for (1) the presence of desynaptic genes in some varieties, (2) absence of any chromosomal aberration, (3) reduction in chiasma frequency consequent upon selfing, and (4) the possibility of teosinte-introgression in many varieties. All varieties examined so far are free from B-chromosomes.

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