

2. High transmission frequency of a *Tripsacum* chromosome in a hyperploid maize stock.

A 21 chromosome stock was obtained in a third backcross to corn generation of a corn-*Tripsacum* hybrid. The extra chromosome was about the length of corn chromosome 10 and its short arm, which carried a small terminal knob, had approximately half the length of the long arm. This extra chromosome never showed any tendency to synapse with any of the corn chromosomes and always appeared as a univalent at pachytene, diakinesis and metaphase I. Seven of 13 plants carried this chromosome. Five of the seven 21 chromosome plants had only defective pollen, and these were out-crossed, producing progenies totalling 62 plants, 56 of which contained the extra chromosome. The other 2 of the seven 21 chromosome plants had 40 percent to 50 percent normal appearing pollen, and these were selfed. In a total of 12 plants obtained from these selfings eight contained 21 chromosomes, one 20 chromosomes and three 22 chromosomes with the extra chromosome of the previous generation present in duplicate and always forming a bivalent at pachytene, diakinesis and metaphase. All ears produced on plants carrying extra chromosomes appeared to have reduced ovule fertility. Most 21 chromosome plants had completely defective pollen, but again two had normal appearing pollen, and two had about half normal appearing pollen. The pollen of the three 22 chromosome plants was about 65, 80 and 95 percent normal in appearance. Pollen of 20 chromosome segregants appeared normal.

Although more data are needed, it appears that presence of the extra chromosome singly usually inhibits the production of normal pollen while its presence in duplicate may not effect pollen production, or may effect it to a much lesser degree. Pollen which carries the extra chromosome not only functions but competes with some measure of success against 10 chromosome pollen.

The apparent high transmission frequency of the extra chromosome through the egg (75 to 80 percent) is of particular interest, and megasporogenesis will be studied. It is not known whether differential viability of 10 and 11 chromosome eggs may be a factor in plants of the peculiar constitution involved in these studies or whether there is a tendency for 11 chromosome megaspores to occupy the functional position. In microsporocytes the extra chromosome usually lags at metaphase and anaphase I. It may divide in either meiotic division and frequently fails to be included in a nucleus at telophase.

Possible effects on quantitative characters of the chromosome derived from *Tripsacum* when present singly and in duplicate are being studied, and genetic tests have been initiated for presence on the chromosome of loci common to corn.

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