ADDENDUM:

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1. Doubly and triply monosomic Zea mays.

When plants heterozygous for the $\underline{r}_{x-1}$ deficiency are used as females, a high frequency of monosomic individuals are produced in the $\underline{r}_{x-1}$ carrying progeny (Satyanarayana, unpublished). These are produced by a nondisjunctional event which takes place after meiosis during the megaspore divisions of the embryo sac.

Over 250 monosomic plants have been obtained in my work this past summer with this system. The monosomic plants are surprisingly vigorous and good microsporocyte samples have been taken from several of the individuals. In addition, a few pollinations have been possible using these plants. In addition to singly monosomic plants, doubly and triply monosomic plants are obtained. The doubly monosomic plants are currently under analysis to determine if distributive pairing is taking place in these plants. The triply monosomic plant had necrotic sectors on its leaf surfaces and it was stunted. At diakinesis in this plant, three univalents and 7 bivalents were regularly found. At metaphase I, the 3 univalents were usually positioned somewhat off of the metaphase plate at random in the cell. It is very surprising that a plant is able to tolerate this very large amount of chromosomal imbalance!

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2. The effect of B chromosomes on intragenic recombination.

Low numbers of B chromosomes apparently have little of no effect on the phenotype of maize while higher numbers cause several abnormalities. Cytological evidence that B chromosomes increase the mean chiasma frequency in maize has been shown by Ayonaadu and Rees (Genetica 39: 74, 1968). B chromosomes have also been shown to increase recombination between loci on chromosome 5 (Nel, M.G.N.L. 42: 63, 1968; 43: 54, 1969) and chromosomes 3 and 9 (Hanson, M.G.N.L. 35: 61, 1961) in maize. The present study was

TABLE 1

(1st genetic background)

Plant Number	Number of B-chromosomes	Recombinants	Population	Crossover Frequency X 10^{-4}
5	0	332	369,585	9.88
6	0	250	210,780	11.86
8	0	278	297,225	10.28
9	0	388	344,745	11.25
12 WIM	0	280	238,815	11.72
Totals		1528	1,461,150	10.457 s=0.87
10	1	416	334,170	12.45
11	2	648	412,785	14.93
15	1 or 2	470	314,640	15.69
Totals		1534	1,061,595	14.449 s=1.68

TABLE 2

(2nd genetic background)

Plant Number	Number of B-chromosomes	Recombinants	Population	Crossover Frequency X 10^{-4}
G 2	1	206	253,080	8.1
G 3	1	112	140,220	7.9
Totals		318	393,300	8.06 s=0.14
G 4	0	178	284,175	6.2
G 6	0	160	247,860	6.4
Totals		338	532,035	6.35 s=0.02

initiated to determine if B chromosomes also increase intragenic recombination in the waxy locus of maize.

Recombination between the $\underline{wx}^{c}$ and $\underline{wx}^{90}$ pseudoalleles of the waxy gene was determined with pollen grains using techniques developed by Nelson (Genetics 60: 507, 1968). These plants contained 0, 1, or 2 B chromosomes.

Two slightly different genetic backgrounds were used to determine the effects of B chromosomes on intragenic crossing over (Tables 1 and 2). All plants in each of the tables were sibs and grown at the same time under the same conditions. The results show that B chromosomes increase intragenic recombination at the waxy locus. Since increased recombination values are found both for intragenic recombination and intergenic recombination in the presence of B chromosomes, this lends support to the idea that one mechanism is involved both in intragenic and intergenic recombination.

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