

Table II. Coefficient of coincidence values (data from Table I)

No. of B-chromosomes	Crossover region		
	(1,2)	(1,3)	(2,3)
0	0.48	0.13	0.12
1-4	0.41	0.18	0.17
6-9	1.00**	0.60**	0.85**
1-9	0.53	0.26**	0.35**

\*\* Significantly different from 0 B-chromosome class at 1% level.

It may be noted that B-chromosomes decrease chromosomal interference in all three regions and the effect is greater with the higher number of B's.

To state the results differently, the decrease in interference was found to be greatest near the centromere as was the increase in single crossovers. However, the latter effect was reversed near the end of the short arm of chromosome 9 (the presence or absence of a knob in this region has not yet been ascertained).

Supernumerary chromosomes have been known for some time to exist in many plants and animals; however, cytogeneticists have in most cases been unable to ascribe a particular function to them. The data presented above suggest one such function. This idea is supported by studies by Barker (*Heredity* 14:211-214, 1960) in the grasshopper *Myrmeleotettix maculatus*. He found that populations which possessed supernumerary chromosomes had a higher chiasma frequency than populations which lacked them.

The corresponding data with other chromosome testers is being analyzed. Also studies are being carried out utilizing larger numbers of B-chromosomes.

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## 2. Crossing over and segregation in plants heterozygous for T6-9b.

It was reported previously that plants heterozygous for T6-9b (breaks:6L,10-9S,37) give an excess of the normal chromosomes when used as female parents in the backcross. Normal and translocated chromosomes are recovered with about equal frequencies from the heterozygous male. The progeny of the two backcrosses (♂ and ♀) also differ in that crossing over in the short arm of chromosome 9

is more frequent in the microsporocytes than in the megasporocytes although it is less than normal in both cases. When the genes tested are in repulsion phase, one class of crossovers may be confused with tertiary trisomes (6, 9, and 6<sup>9</sup>), which occur with a low frequency in both backcross populations. In these cases the crossover frequency was obtained by doubling the value found for the reciprocal crossover class. When the genes are in coupling phase the tertiaries are included with the non crossovers and have a negligible effect on the crossover frequency. Some reduction in the frequency of crossing over in 9S is expected because all tested plants were heterozygous for a large terminal knob and for wd. Since not all the progenies were tested for yg, the population totals for Yg-Sh and Sh-Wx values differ. The data are given below:

Constitution	Heterozygous parent	$\Sigma$	Yg-Sh %	$\Sigma$	Sh-Wx %	$\Sigma Wx$	Total recombination
$\frac{T \ Wx \ Sh \ wd \ k}{N \ wx \ sh \ Wd \ K^L}$	♀	561	1.1	1963	0.97	33.0	2.07
"	♂	1617	9.2	6525	13.8	51.5	23.0
$\frac{T \ Wx \ sh \ Wd \ K^L}{N \ wx \ Sh \ wd \ k}$	♀	530	0.2	1026	1.2	35.3	1.4

The position of the knob on the translocated or on the normal chromosome has little effect on the transmission of the translocated chromosomes (Wx marks the break point) or on the frequency of crossing over in 9S. The structural heterozygosity from both the translocation and the presence of the large knob on one of the homologues results in defective pairing of 9S in pachynema and it is not surprising to find a great reduction in crossing over in this arm.

Ellen Dempsey

### 3. Crossing over in plants homozygous for T6-9b.

In plants homozygous for T6-9b, crossing over was tested in the Yg-C and C-Wx regions. Duplicate plantings were made from the same ear; family 23234 was grown in the greenhouse and 24124 in the field. PMC were obtained from plants in family 24124 and all had knobless chromosomes 9. Probably most of the plants in family 23234 had the same constitution, but the possibility exists that a few may have been K<sup>4</sup>9/k9. The crossover values from ♂ and ♀ backcrosses are shown in the table with the standard values (Emerson, Beadle, and Fraser) and some of Rhoades' for comparison.