

The S locus has been located on chromosome 2 at about 10 units beyond fl at position 78 (Prensky, MNL 31: 73). Data are given here which show linkage of S with B and ts.

	+:ws	+:gl	B:b	+:ts	Crossover percentages	
					<u>B-S</u>	<u>ts-S</u>
1. $\frac{Ms \ ws \ gl \ b \ S}{ms \ + \ + \ b \ s} \times \frac{Ms \ ws \ gl \ B \ S}{ms \ + \ + \ b \ s}$	66:22	62:26	64:24	---	27.3	---
2. $\frac{Ms \ ws \ gl \ B \ ts \ S}{ms \ + \ + \ b \ + \ s} (X)$	96:23	92:27	104:15	64:55	25	7.6
3. $\frac{Ms \ ws \ gl \ B \ ts \ S}{ms \ + \ + \ b \ + \ s} (X)$	92:38	92:38	116:14	69:55	21.5	11.3

Plants of  $\frac{ts \ S}{+ \ S}$  constitution produce two types of functional pollen--ts S and + S. The frequency of the latter type is the frequency of ts-S crossing over. The values obtained for the B-S and ts-S regions are in good agreement with Prensky's data and place the S locus close to the centromere of chromosome 2.

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7. The influence of abnormal chromosome 10 (K 10) on the recombination frequency between r and sr<sub>2</sub>.

Joachim and Burnham (MNL 29) reported that g-r-sr<sub>2</sub> appears to be the linear order of these genes on normal chromosome 10 (k 10). The recombination values obtained for the r-sr<sub>2</sub> region ranged from 21.4% to 31.0%. In MNL 30, Joachim confirmed the linear order and obtained recombination values ranging from 25.1% to 31.5%.

The experiment reported here was carried out to determine the effect of abnormal chromosome 10 (K 10) on the recombination frequency between r and sr<sub>2</sub>. The backcross data shown below were obtained for sib plants segregating for abnormal chromosome 10.

	(0)	(0)	(1)	(1)	(2)	(2)	(1-2)	(1-2)	$\Sigma$
	<u>g + +</u>	<u>+ r sr</u>	<u>g r sr</u>	<u>+ + +</u>	<u>g + sr</u>	<u>+ r +</u>	<u>+ + sr</u>	<u>g r +</u>	
$\frac{g + + \ K}{+ r \ sr \ k}$	564	196	33	87	3	5	0	0	888
$\frac{g + + \ k}{+ r \ sr \ k}$	235	233	47	54	159	154	9	5	896

## Recombination:

	<u>K 10/k 10</u>	<u>k 10/k 10</u>
g-r	13.5%	12.7%
r-sr <sub>2</sub>	0.9%	36.4%
g-sr <sub>2</sub>	14.4%	46.2%
Double crossovers	0.0%	1.6%

## Percentage:

g	67.6*	49.8
R	73.6*	51.0
Sr	73.9*	50.0

\* Statistically significant difference from a 1:1 ratio.

The data indicate that there is a drastic reduction in the recombination frequency between r and sr<sub>2</sub> in sibs having the abnormal chromosome 10. This reduction could be attributed to non-homology between abnormal 10 and normal 10 in the distal 1/6 segment of the long arm of normal 10. The absence of double crossovers in K 10/k 10 plants should not be surprising, since there is a great reduction in recombination between r and sr. (The frequency of expected double crossovers in the K 10/k 10 class is 1.2%.) The recombination value obtained for the r-sr region in k 10/k 10 sibs shows that there is considerable crossing over in the region distal to r. This is in agreement with crossing over data obtained by Joachim and Burnham.

In the g-r region, where there is homology between K 10 and k 10 chromatin, there exists no detectable difference between the recombination values obtained for the respective sib classes.

8. Preferential segregation in chromosome 9.

## A. The effect of knob size.

(1) Heretofore it has been regarded that, in the presence of abnormal chromosome 10, preferential segregation of the other nine chromosomes occurs only when one homologue is knobbed and the other is knobless. When both homologues have the same sized knob there is no preferential segregation even when abnormal 10 is present. In a family segregating for  $K^L 9S \underline{+} \underline{wx} / k 9S \underline{wd} \underline{+}$  and  $K^L 9S \underline{+} \underline{wx} / K^M 9S \underline{+} \underline{+}$  plants ( $K^L$  = a large knob on chromosome 9 nearly the same length as the heterochromatin of abnormal 10;  $K^M$  = knob approximately 2/3 the size of  $K^L$ ;  $K^S$  = knob size approximately that found for chromosome 9 in "KYS" strain), the Wx:wx ratio was checked in plants of the  $K^L/K^M$  constitution. Statistically the Wx:wx ratio was found not to be a 1:1 ratio. Since this locus is quite removed from the knob of the short arm, the following set-up was used to determine whether this finding was apparent or real.