virescence. The severely virescent plants did, however, develop pigment and produced kernels which were used in a histological study.

These observations indicate that there is indeed an enhancement effect associated with the interaction of et and M^{et}. It apparently affects the development and maturation of plastids (chloroplasts and leucoplasts) as first suggested by Greenblatt (M.G.C.N.L. 36 & 37).

If we try to reconstruct this system in terms of enhancement effects and the postzygotic lethality associated with the etched locus (see Cox M.G.C.N.L. 40:39-42), the following picture emerges.

	Kernel Genotype	Endosperm Phenotype	Seedling Phenotype
I.	et/et; + +	Moderate to poor etching	Virescence +
II.	et/et; M^{et} +	Severe etching	Extreme virescence
III.	et/et; M^{et} /M^{et}	Postzygotic arrest, no mature kernels	---------

The above scheme suggests that the modifier, M^{et}, which is independent of the linkage group of the mutant etched allele, interacts with etched to upset normal plastid development.

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Delano K. Cox

3. The effect of abnormal chromosome 10 on recombination in Tp9/N9 plants.

Rhoades (1958, M.G.C.N.L. 32:66-70 and unpublished) has intensively studied a segment transposed from the long arm of chromosome 3 (3L) to the short arm of chromosome 9 (9S). Recombination values were determined in bivalents consisting of one normal chromosome 9 (N9) and one carrying the transposed segment from chromosome 3 (previously designated as Dp9 but now designated as Tp9 by Rhoades). Recombination along the entire length of 9S was strongly decreased in plants heterozygous for the transposition. A corresponding decrease in the precision of chromosome pairing in 9S at pachynema has also been demonstrated by Rhoades and Dempsey (unpublished). They found that the buckle induced by the transposition is not located at a constant position in 9S, but it could be found at essentially any position in 9S. Frequently the buckle is not even seen since it was retracted into the chromosome. These genetic and cytological results have been confirmed by the author. (The same transposition was used by the author in a previous study reported in this newsletter (Weber, M.G.C.N.L. 41:204-206).

The present study is designed to determine the effect of abnormal chromosome 10 on this system. Recombination in sister plants of the following constitutions was analyzed:

Table 1

Female parent	Male parent	Total	C-Sh recombinants	Sh-Wx recombinants	% C-Sh recombinants	% Sh-Wx	# plants
c sh Tp wx / C Sh N Wx ; k10 / k10	c sh N wx ; k10	1137	42	10	3.7	0.9	3 (3 ears)
c sh Tp wx / C Sh N Wx ; K10 / k10	c sh N wx ; k10	1753	84	30	4.8	1.7	5 (5 ears)
c sh N wx ; k10	c sh Tp wx / C Sh N Wx ; k10 / k10	1411	70	54	5.0	3.8	2 (8 ears)
c sh N wx ; k10	c sh Tp wx / C Sh N Wx ; K10 / k10	1587	80	43	5.0	2.7	2 (7 ears)

Table 2

Female parent		Male parent	Total	Recombinants	% Recombination	# Plants
Yg c Tp klO / yg C N klO	sib plants	yg c N klO	535	29	5.4	1 (2 ears)
Yg c Tp KlO / yg C N klO	sib plants	yg c N klO	1530	322	21.0	4 (6 ears)
Yg c Bz Tp klO / yg C bz N klO	sib plants	yg c N klO	367	48	13.1	1 (1 ear)
		yg bz N klO	244	30	12.3	1 (1 ear)
Yg c Bz Tp KlO / yg C bz N klO	sib plants	yg c N klO	3287	796	24.2	9 (11 ears)
		yg bz N klO	256	66	25.8	1 (1 ear)

$$\frac{c\ sh\ Tp\quad wx}{C\ Sh\ N\quad Wx}\ ;\ \frac{K10}{k10} \qquad \text{and} \qquad \frac{c\ sh\ Tp\quad wx}{C\ Sh\ N\quad Wx}\ ;\ \frac{k10}{k10}$$

Tp = the point of insertion of the transposed segment in a chromosome carrying the transposed segment
N = the point of insertion of the transposed segment in a chromosome not carrying the transposed segment
K10 = abnormal chromosome 10
k10 = normal chromosome 10

The cytological constitutions of all plants in this study were determined by analysis of microsporocytes. Both types were crossed by c sh N wx testers. The results are presented in Table 1.

To examine recombination between Yg and C or Bz in this system, the following cross was made:

$$\frac{Yg\ c\ sh\ Bz\ Tp\ wx}{Yg\ C\ Sh\ Bz\ N\ Wx}\ \frac{K10}{k10}\ \text{(from the above cross)} \quad X \quad \frac{yg\ C\ sh\ bz\ N\ wx}{k10/k10}$$

This cross produces four plant types, two of which were used in further tests. These are:

$$\frac{Yg\ c\ sh\ Bz\ Tp\ wx}{yg\ C\ sh\ bz\ N\ wx}\ \frac{K10}{k10} \qquad \text{and} \qquad \frac{Yg\ c\ sh\ Bz\ Tp\ wx}{yg\ C\ sh\ bz\ N\ wx}\ \frac{k10}{k10}$$

These were crossed by yg c or yg bz plants. The results are given in Table 2.

From these data it can be seen that recombination is essentially unaffected in the C-Sh-Wx region by the presence of one abnormal chromosome 10. However, abnormal chromosome 10 greatly increased recombination in the Yg-C region.

A cytological examination of these plants is being undertaken to determine if there is a corresponding alteration of chromosome pairing in 9S at pachynema.

David Weber