

undetected by electrophoretic analysis. The presence of Class II and III type mutations offers strong support, along with the previously presented evidence, that this protein is specified by the Sh₁ gene, since qualitative and quantitative changes in the protein are associated with the appearance of the sh₁ phenotype.

Prem S. Chourey

4. An effect of B chromosomes on crossing over in chromosome 5.

It was reported in last year's News Letter (p. 63) that B chromosomes might cause an increase in crossing over in the A₂-Bt₁-Pr region of chromosome 5. This work was followed up during the summer of 1968, when plants of two related families (536 and 537) which were heterozygous for A₂Bt₁Pr were root-tipped and scored for B chromosomes, then transplanted to the field and backcrossed as females and as males to a₂bt₁pr testers.

The results are shown below:-

Family no.	Used as:	No. of plants	No. of B's	No. of kernels	% Recombination			
					<u>A-Bt</u>	<u>Bt-Pr</u>	Total	% increase
537	♀	8	0	2897	5.9	15.9	21.8	-
		8	1	2797	6.9	18.1	25.0	15
		10	2	3197	8.8	21.7	30.5	40
536	♀	4	0	1529	8.2	23.0	31.2	-
		10	2	3493	9.6	22.3	31.9	2
		10	4	3527	10.7	25.3	36.0	15
537	♂	9	0	4560	11.3	26.8	38.1	-
		8	1	4505	15.1	31.8	46.9	23
		10	2	5814	17.7	34.6	52.3	37
536	♂	5	0	2764	13.4	26.0	39.4	-
		10	2	4812	18.1	35.8	53.9	37
		10	4	4829	23.6	37.6	61.2	55

The recombination values for the Bt₁-Pr region were obtained from the A₂ kernels only, since a₂ kernels lack color.

Although the data have not yet been statistically analyzed, both of the above families and the one mentioned last year showed increased

recombination for the A_2-Bt_1-Pr region in the megasporocytes when B chromosomes were present. Furthermore, it appears that the B chromosomes had a dosage effect. The increase in crossing over and the dosage effect in both the A_2-Bt_1 and Bt_1-Pr regions were more marked in the microsporocytes than in the megasporocytes and are similar to those obtained by Rhoades for the $C-Wx$ region of Tp9 plants. In the latter case, however, there was a corresponding decrease in the recombination value for the adjacent Yg_2-C region of chromosome 9, which would indicate a shift in the distribution of crossovers along the chromosome arm (cf. "Replication and Recombination of Genetic Material", pp. 229-241. Eds. W. J. Peacock & R. D. Brock. Austral. Acad. Sci., Canberra, 1968). Ayonoadu & Rees (Genetica 39:75) have reported indications of an altered distribution of chiasmata and have found an increase in the total number of chiasmata, due to B chromosomes in Black Mexican Sweet Corn. The increased recombination in the A_2-Bt_1-Pr region of chromosome 5 could thus be the result of a shift in the distribution of crossovers, an increase in the total amount of crossing over, or a combination of both.

Paul Nel

5. Further studies on chromosome elimination induced by supernumerary B chromosomes.

In the 1967 Maize News Letter and in a paper appearing the same year in the Proc. Nat. Acad. Sci., data were presented showing a correlation between the number of B chromosomes and the rate of loss of the A_1 allele in chromosome 3 at the second division of the microspore. In plants with low numbers of B's there was little or no loss of the A marker while in individuals with higher numbers of B's this locus was eliminated in 10% or more of the sperm cells. The earlier data did not provide a good estimate of the dosage effect of B's on loss of the A locus. Not all of the classes were represented and the data were fragmentary in some cases. Rather extensive data have since been obtained from a set of closely related plants in which the numbers of B chromosomes ranged from none to eight. The frequencies of F_1 endosperms exhibiting the recessive a phenotype in crosses of $a a \text{ } \varphi \times A A \text{ } \sigma^7$ where the pollen parents differed in numbers of B's are given below: