CYTOLOGICAL TESTS OF MONOSOMES AND TELOSOMES WITH TRANSLOCATIONS

J.E. Endrizzi and G. Ramsey

Through the courtesy of Dr. Meta S. Brown we have all the translocation stocks that she has developed over the years. These stocks identify 24 of the 26 chromosomes of G. hirsutum, and many of these are being used in crosses with monosomes and telosomes to identify the deficiency. A number of selected cross combinations were made in 1972 and the F_1s were planted this year. The results of the field analysis are shown in the following table. In some of the crosses, the deficiency was not recovered and these are designated by "nr." A "+" designation shows that the monosome or telosome is one of the chromosomes in the translocation. The table shows that all "+" combinations involved telosomes and translocations and only these positive results will be discussed.

The telocentric from Mo5 was associated with the T20-21 translocation, and since this is the first deficiency associated with these two chromosomes, chromosome 20 was assigned to Mo5 and the telocentric from it. The unequal bivalent which carries the pollen color locus (Pa) was identified as chromosome 5 by its association with T4-5 translocation. It was known previously that the Pa unequal bivalent was not chromosome 4 since we have monosomes and telosomes for chromosome 4 which are different in many respects from the Pa telosomic chromosome.

The telocentric chromosome designated as H1 or H7 was crossed to the T1-7 and T6-7 translocations and cytological observations showed that the telo was associated with both translocations. This, of course, means that the telocentric chromosome is chromosome 7. It had been originally assumed that this telocentric involved chromosome 7, but an earlier test had suggested that it was not this chromosome. Additional tests are planned to confirm the chromosome 7 identity of this chromosome. Two telocentrics designated as originating from Mo18 in which one is telocentric for the short arm and the other is telocentric for long arm of the chromosome, were identified as being chromosome 6 by their association with the T6-7 translocation. Chromosome 7 was ruled out by the fact that neither of the two telocentrics have plant phenotypes characteristic of plants that are telosomic or monosomic for chromosome 7.

Cytotype	Test with translocations									
	T2-8	T2-14	T4-5	T9-17	T10-19	T11-12	T20-21	T20-22	T1-7	T6-7
Mo15a		--			--		--	--		
Mo24vl	nr		nr	nr	nr	nr				
Mo34vl			nr		nr	--				
Mo51vl						--				
___/Mo5 H20		--					+	nr		
___ H1 or H7									+	+
___ Pa H5	--		+		--	--	--			
___/Mo18										+
___/Mo18										+
___/Mo30	--				--	--				
___ gl_2	--		--			--				
___ gl_2					--					--
___ gl_3		--			--		--	--		
___ sm_1					--					

CYTOLOGICAL ANALYSIS OF PHENOTYPICALLY ABNORMAL PLANTS FOUND IN EXPERIMENTAL BLOCKS

J.E. Endrizzi, W.D. Fisher, and G. Ramsey

Dr. W.D. Fisher observed a number of off-type plants in field cultures in 1972 and a number of these were selected for cytological analysis. These plants were stumped in the fall, taken to the greenhouse and potted. The cytological analysis of the selected plants is given below and it can be seen that only one was a simple monosomic, and it involves a D chromosome. This monosomic plant has long fruiting branches, and it is possible that this chromosome could be different from the few D chromosomes we now have identified as monosomes. Five plants contained unequal bivalent which are also very useful in our chromosome identification program. Three of these involve telocentrics and these will be studied further to determine whether they may be different from other unequal bivalents we are currently studying.

Plant No.	Phenotype	Cytological Analysis
AZ615 6833-204-203	Small misshapen ball	24II IV dd
AZ616 6817-208-202	Staggy, small late bolls	25II IIIcl = 2n+iso
AZ617 6901-342	Staggy, small late bolls	24II IV dd
AZ618 6908-333	Cluster	25II III = 2n + 11
AZ619 6908-327	Staggy	25II s≠ II
AZ620 6908-340	Small bolls	24II IIIvl (tert. 2n-1)
AZ621 6908-291	Staggy	26II
AZ622 6908-279	Large nodes	25II l≠ II