

out. The other experiment involves the use of CIB/f B odsy heterozygotes with + B + / f B odsy sibs. Our interest in using the CIB inversion stems from the fact that Inversion 3a heterozygotes in maize produce a high rate of alpha derivatives from A^b.

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2. Pairing of normal and inversion chromosomes in trisomic-3 individuals.

The occurrence in the 1957 nursery of a trisomic-3 individual, whose chromosomes 3 were differentially marked at the a₁ and sh₂ loci, one carrying Inversion 3a, provided an opportunity to determine whether this inversion has an effect on frequency of synapsis in a nucleus which also carries two normal chromosomes.

This trisomic individual, having the constitution A^b sh/a sh/Inv. 3a: a Sh, was pollinated by a a sh/a sh tester plant, and colored non-shrunken kernels were planted for test in 1959. Pollen of twelve of these plants, whose constitution was again that of the parent trisomic, was used on a a sh/a sh tester plants to produce ears for the data presented below:

Trisomic plants used as pollen parents	Number of ears scored	Phenotypic Classes				Total kernels scored
		I Colorless, non-shrunken	II Purple, shrunken	III Colorless, shrunken	IV Purple, non-shrunken	
59-466-1	5	217	455	438	23	1,133
-2	2	100	197	177	2	476
-3	5	281	547	491	9	1,328
-4	4	149	418	386	9	962
-5	5	228	453	460	20	1,161
-6	4	303	505	488	7	1,303
-7	6	307	606	608	20	1,541
-8	5	184	405	364	13	966
-9	5	290	583	579	8	1,460
-10	2	70	232	206	5	513
-11	4	183	464	455	9	1,111
-12	5	337	630	563	11	1,541
Total	52	2,649	5,495	5,215	136	13,495
Per cent		19.6	40.7	38.6	1.0	99.9

Three main classes of kernels were obtained: about 20% colorless non-shrunken, representing primarily those receiving Inv. 3a: a Sh gametes; about 40% purple shrunken (A^b sh); and about 40% colorless shrunken (a sh). The fourth class (to be tested in 1960) may represent the rare functioning of disomic pollen carrying A^b sh and Inv. 3a: a Sh to give trisomic embryos; trisomics Inv. 3a: a Sh/a sh/a sh may be included in class I and A^b sh/a sh/a sh in class II. This may explain the highly significant difference between classes II and III.

In a trisomic, any one of the three chromosomes would be expected to pair at the centromere region in 67% of the cells, disjoin normally from its partner, and transmit in 33% of the balanced gametophytes. The 20% transmission found here for the inversion-carrying chromosome indicates that its pairing in the centromere region is greatly reduced.

That the inversion chromosome does not carry an aberration reducing transmission in pollen was checked by counting colorless (Inversion 3a) and purple (normal 3) kernels on diploid selfed ears. On ten such ears 2,463 purple kernels (74.2%) and 858 (25.8%) colorless kernels occurred. Trisomic plants carrying two Inversion 3a chromosomes and one normal one are available for test next summer.

The data reported here are in agreement with the results of a similar study reported by G. G. Doyle in the 1959 issue of M. G. C. N. L.

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