with TB-9b plants, did not show preferential fertilization. This would seem to indicate that there is a genetic basis for determining whether or not preferential fertilization will occur.

References:

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2. Location of the modifier gene of the $\underline{cl_1}$ locus.

The white-albino mutant $\underline{cl_1}$ is located on chromosome three. Two alleles of this mutant are known $\underline{w}_{7716}$ and $\underline{cl_p}$. These mutants have the white (or pale yellow) endosperms and albino seedlings typical of this class of mutants. Four dominant, allelic modifiers of these genes have been described (Heredity 21:1-7, 1966) which, when present, partially or completely suppress the albino phenotype. Depending upon the modifier present, the seedling can be pale green (pastel) or green. The modifiers do not alter the endosperm phenotype.

Attempts to locate the locus of the modifier alleles have been frustrated by the rather widespread occurrence of modifier genes in genetic stocks. In the F_2's of crosses of the $\underline{cl_1}$ alleles to the inbred M14, pale green (pastel) or green seedlings segregated in the white endosperm class. These results indicate that this inbred carries two modifiers, one responsible for pale green seedlings and the other for green seedlings. To verify that the green M14 modifier was allelic to the other known modifiers of the $\underline{cl_1}$ locus, plants of the following genotypes were self pollinated: $\underline{w}_{7716}\ \underline{Cl}_M^{M14}/ \pm\ \underline{Cl}_M^4$, $\pm\ \underline{cl}_M^{M14}/\ \underline{cl_p}\ \underline{Cl}_M^4$ and $\underline{w}_{7716}\ \underline{Cl}_M^{M14}/\ \underline{cl_p}\ \underline{Cl}_M^4$. From these selfs, the white or pale yellow seeds were planted in a seedling bench. If $\underline{Cl}_M^{M14}$ is allelic to $\underline{Cl}_M^4$, no albino seedlings will be observed. Out of 2,221 seedlings grown, no albinos were found. Another allele test was made involving the $\underline{Cl}_M^3$ modifier.

In this test the white or pale yellow seeds from the selfs of the following genotypes were grown: $\underline{+}\ \underline{Cl}_M^{M14} / \underline{cl}_1\ \underline{Cl}_M^3$ and $\underline{w}_{7716}\ \underline{Cl}_M^{M14} / \underline{cl}_1\ \underline{Cl}_M^3$. Out of 2,438 seedlings tested no albinos were observed. From the two tests a total of 4,659 seedlings were grown without the production of a single albino. This would indicate that the $\underline{Cl}_M^{M14}$ allele is allelic to the other modifiers at the $\underline{Cl}_M$ locus.

Since the inbred M14 carries a modifier allelic to the other known modifiers of the $\underline{Cl}_1$ alleles, a series of waxy translocations which had been converted to the M14 background were crossed to stocks carrying $\underline{cl}_1$ or $\underline{w}_{7716}$ without the modifiers. The F_1's of these crosses were self pollinated and starchy and waxy pale yellow and/or white seeds planted. Linkage with a particular translocation should result in a surplus of albino seedlings in the starchy class and a corresponding deficiency in the waxy class. These conditions were found for only T $8\text{-}9_{6673}$ (Table 1).

In spite of the deficiency in the waxy class, there is a definite indication of linkage with $T8\text{-}9_{6673}$ (breakpoint at 8 L.35). To obtain more reliable linkage data, a modified testcross will be made by crossing the F_1 to a waxy OH43 line that does not carry any $\underline{cl}_1$ modifiers. The plants from the starchy and waxy testcross seeds will be grown, classified for pollen sterility and self pollinated. Plants segregating for pale yellow or white seeds will be tested for the presence of the modifier gene to determine the association between the translocation, waxy and the modifier locus.

As mentioned above, the inbred M14 carries two modifiers of $\underline{cl}_1$ expression (i.e., one responsible for green seedlings and the other for pale green seedlings). The allele tests reported above with $\underline{Cl}_M^4$ and $\underline{Cl}_M^3$ involved the green modifier from M14, while the translocation used in the linkage test carried the pale green modifier. Since this latter modifier has not been allele tested with the known modifiers there is a chance that the gene carried on chromosome 8 might not belong to the same locus as the others. This seems unlikely since so far five independently occurring modifiers have proven to be allelic. However, to be sure that the same locus is involved, the pale green modifier from M14 will be allele tested with one or more of the other modifiers.

Table 1. F_2 seedling data involving the pale yellow and/or white seeds from the F_1 between <u>wx</u>T8-9$_{6673}$ and $\underline{w}_{7716}$

Plant	Wx		wx	
	Pale green (pastel)	Albino	Pale green (pastel)	Albino
66-7149-3	24	8	3	0
-6	20	12	13	1
70-3211-1	17	5	7	0
-4	18	12	7	1
-8	19	10	5	0
-12	23	4	8	0
-13	16	7	2	0
-15	10	5	3	1
-17	13	7	3	1
-20	15	6	7	0
-26	27	10	7	0
-28	9	11	3	1
-29	8	5	0	1
	219	102	68	6

Another series of tests is being made to confirm the location of the modifier locus. This involves crosses of $\underline{cl}_1$ $\underline{cl}_1$ $\underline{Cl}_M^3$ $\underline{Cl}_M^3$ plants with a series of waxy-chromosome nine translocations in the background of the inbreds OH43 or N25. Since neither of these inbreds carry $\underline{cl}_1$ modifiers, the F_1 plants should be heterozygous for the modifier locus, waxy and the translocations. It, therefore, should be possible to obtain evidence of linkage from the F_2 populations of these crosses.

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