

this difference is confirmed by further tests, an explanation should be sought. It is not obvious why the nuclear conditions existing prior to the meiotic separation of homologues should influence the nondisjunction of B^9 during the second microspore division.

Another peculiarity of the two genotypes (balanced and hyperploid) was observed after comparing the total ratio of $\underline{Wx} : \underline{wx}$.

	Total \underline{Wx}	Total \underline{wx}
Balanced translocation	344	351
Hyperploid translocation	6,142	2,002

In the case of balanced translocation, the ratio found is close to the expectation since the loss of all deficient spores ($9^B \underline{Wx}$) is compensated by the loss of a considerable number of hyperploid spores ($9 \underline{wx}, B^9$) in the male gametophyte. In the case of the hyperploid translocation, an enormous excess of \underline{Wx} was found. Since the two B^9 's are expected to undergo a fairly regular meiotic segregation, most of the microspores will be either $9^B \underline{Wx}, B^9$ (balanced) or $9 \underline{wx}, B^9$ (hyperploid). The latter type is frequently lost by gametophyte competition to the extent indicated by the observed ratio of $\underline{Wx} : \underline{wx}$.

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1. Test for cytoplasmic mutants induced by E.M.S. seed treatment.

The tests for induced mutations with which I am familiar were not planned to test for possible cytoplasmic mutants. This experiment was planned to test only for that type.

The first experiment was set up in 1970, but the treatment was too heavy. The main growing point tissue in many plants was killed or so heavily damaged that the plants were highly deformed. Many of them developed tillers but only a few had ears or tassels. The next experiment was begun in 1971, using a less severe treatment. In both experiments, the

plants grown from the treated seed were remarkably uniform. The treatment procedures were those recommended by our colleague, Dr. Robert A. Heiner, for obtaining uniform and repeatable results with E.M.S. seed treatment. The plants grown from treated seed in 1971 were uniformly shorter than those from the check from late seedling stage to maturity. At the time of harvest of plants from the treated lot, I noted that some had only 3 nodes below the ear node, none with more than 4 (avg. 3.6), whereas for the untreated check only an occasional one had 4 and most of them had 5 (avg. 5.0) below the ear node.

Pollen from untreated A619 was used on the plants from treated seed of inbred A619. Each ear was tested in a 75-seed row in the field in 1972. Isolation was such that open pollination was relied on for increase.

The 242 rows descended from treated and 53 from untreated seed were checked for off-type characters in the seedling and later stages. At pollen shedding, a check was made for male sterility. Had cytoplasmically inherited mutants occurred, at least in sectors which included portions of the ears, they should have appeared (probably in variable numbers) among the progeny in the rows that descended from E.M.S.-treated seed and not from the untreated seed. None were observed. In 36 of the rows from treated seed and in 15 from untreated seed, there was an occasional plant, usually only one in the row, which was thinner-stalked and shorter than normal. Many of these did not extrude their anthers. Also, all but one of the 22 such plants with seed had only a few kernels, but these were all plump and normal in appearance. Had the off-types been triploids, seed size should have varied.

The conclusion is that E.M.S. is not a very effective agent for inducing cytoplasmic mutants. Acknowledgements: Mr. Tom French for making the pollinations in 1971 and checking in 1972 for male sterility and other adult characters. Also the gratuitous help of Dr. Helmy Ghobrial in planting the 1972 field test. Dr. Richard V. Kowles set up the treatments in 1970 and 1971.

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