

Differential induction of paramutation at \underline{R}^r locus

Family	Genotype of parent	Position of the branch on tassel	Mean score of $\underline{R}^r r^s$ kernels
(52-10)-6	$\underline{R}^r \underline{R}^{st}$	Basal	4.54
		Central	7.87
		Top	3.97
(52-11)-1	$\underline{R}^r \underline{R}^{st}$	Basal	6.54
		Central	3.04
		Top	5.96
(52-12)-8	$\underline{R}^r \underline{R}^{st}$	Basal	7.81
		Central	5.09
		Top	2.14
(52-18)-5	$\underline{R}^r \underline{R}^{sc}$	Basal	6.65
		Central	10.91
		Top	4.94
Mc772-1	$\underline{R}^r \underline{R}^{sc}$	Basal	6.11
		Central	3.23
		Top	5.63

interesting case ((52-18)-5) was where in the central branch no paramutation of \underline{R}^r has occurred, while in both basal and top branches it occurred to some degree. The present data do not indicate any simple relationship between differential paramutation of \underline{R}^r and symmetry of the tassel. In some cases the \underline{R}^r alleles from weakly affected branches showed a considerable range of variability. Matings are being planned to test whether the observed differences are heritable and to study the concurrent changes in both alleles of heterozygotes, particularly in $\underline{R}^r \underline{R}^{sc}$ combinations.

These results are in agreement with those previously obtained by H. B. Cooper, Jr. referred to briefly by Brink (Quart. Rev. Biol. 35:120-137).

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6. A non-paramutable, non-paramutagenic \underline{R}^r allele.

Among a collection of \underline{R} alleles from various geographic sources presently being introduced into the W22 inbred line, are several which give self-color in \underline{Rrr} aleurone. This behavior is in contrast to that of the majority of the \underline{R} alleles which are darkly mottled in \underline{Rrr}

kernels, but is comparable to that of all self-colored mutants (R^{sc}) obtained from the pattern alleles, R^{st} and R^{mb} . In a preliminary test conducted in 1959, these same self-colored alleles were shown to be insensitive to the paramutagenic action of the R^{st} allele in $R^{sc}R^{st}$ heterozygotes. Two of these alleles, designated R^E Bolivia 1160 and R^E Ecuador 1172, were included in a 1960 test for paramutagenic action in heterozygotes with R alleles of contrasting plant color, known from previous trials to be paramutable. Results from testcross matings of these heterozygotes show that the R^E Bolivia 1160 allele is definitely paramutagenic, and is thus in this respect also, comparable to the majority of self-colored mutants from R^{st} or R^{mb} . The R^E Ecuador, however, showed no paramutagenic action. It is the only R allele giving red seedlings and anthers thus far found, that is apparently both non-paramutable and non-paramutagenic. In this respect it resembles certain self-colored mutants from stippled or marbled but differs from them in giving plant color. The latter characteristic would appear to exclude mutation from R^{st} or R^{mb} as the origin of R^E Ecuador 1172.

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1. Note on the transposition of Modulator from the variegated pericarp allele.

The P^{vv} allele has been postulated by Brink and Nilan (Genetics 37: 519-544, 1952) to be a compound structure, one component of which is P^{RR} , the top dominant in the multiple allelic series at the P locus on the short arm of chromosome 1, and the other component a genetic element, which suppresses the pigment-producing capacity of P^{RR} , termed Modulator (Mp). The medium variegated phenotype which comprises numerous red stripes of various sizes on a colorless background was assumed to result from the transposition of Modulator from the P locus to a position elsewhere in the genome, thus restoring the normal pigment-producing action of P^{RR} . Progeny tests showed that another phenotype called light variegated often accompanies the mutation to self-red. This variegated phenotype was found to differ from medium variegated in possessing an additional Modulator at some position in the genome other than the P locus.