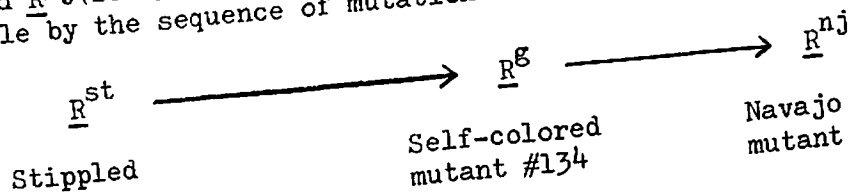


phenomenon. That is, the aleurone cells which become pigmented in $R^{nj}/-/-$ kernels are differentiated with respect to the non-pigmented cells. This does not necessarily imply that the cell types be morphologically distinguishable. The concept implies that there is a master differentiation process, to which the R^{nj} alleles respond, probably under the direction of a specific genetic element (operator like?) located at or near the R locus, by expressing the synthesis of anthocyanin. The phase change concept reaches the same phenotype by implying that the "differentiation" observed results from the specific activation to expression of the R gene in the pigmented cells.

Both concepts, "phase change" and "cell differentiation" imply that R -Navajo alleles be R in basic R locus constitution. Evidence for this has been obtained with one particular R^{nj} allele. The R^{nj} allele studied is designated $R^{nj}(scl\ 34)-14$, and was obtained by mutation of a self-colored (R^G) allele by the sequence of mutation events (M.G.C.N.L. 35:142, 1961);



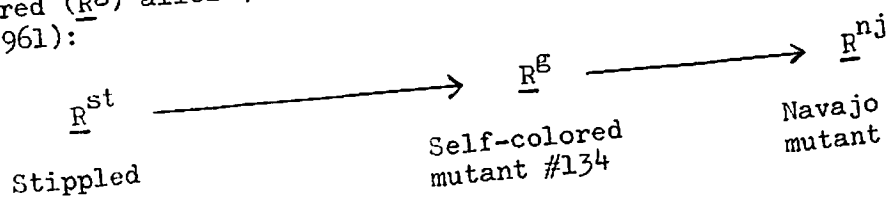
The R^{nj} mutant thus isolated has been observed to mutate to R^G (self-colored). Seven proven R^G (self-colored) mutants have been obtained from R^{nj}/r^r genotypes (rate ca. 30×10^{-4}), and one proven R^G (self-colored) mutant has been obtained from R^{nj}/R^{nj} genotypes (rate ca. 1×10^{-4}). Additional putative mutant kernels are currently being progeny tested, and a suggestive association of mutation of R^{nj} to R^G in R^{nj}/r^r genotypes, with crossing over in the $G - R$ region is being tested further.

The phenotype of the mutant R^{nj} allele studied is quite similar to that of some R^{nj} alleles of natural occurrence. Its origin by the mutation sequence outlined above may mean, however, that it is constituted differently from other naturally occurring R^{nj} alleles. The study of R^{nj} alleles, with emphasis on an attempted recombination analysis of the structure of the R region, is being extended to include alleles R^{nj} (Illinois), R^{nj} (Cudu), R^{nj} (Anderson), R^{nj} (New Mexico) and R. A. Brink's $R^{nj}:st$ (stippled-Navajo). I would appreciate receiving seed of any R^{nj} allele of different origin to those listed.

K. S. McWhirter

2. A paramutagenic Navajo allele at the R locus.

A mutant allele with the Navajo phenotype was obtained by mutation of a self-colored (R^G) allele, by the sequence of mutations (M.G.C.N.L. 35:142, 1961):



The \underline{R}^{nj} mutant thus obtained was tested for paramutagenicity, in $\underline{R}^{nj}/\underline{R}^r$ heterozygotes, and compared with the parent \underline{R}^g (self-colored) allele and \underline{R}^{st} (stippled).

Genotype of staminate parent	Mean aleurone color score of $\underline{R}^r/\underline{r}^g/\underline{r}^g$ kernels* from testcrosses on W23 $\underline{r}^g \underline{r}^g$ ++
\underline{R}^{nj} (mutant) / \underline{R}^r	3.66
\underline{R}^{nj} (mutant) / \underline{R}^r	3.56
$\underline{R}^{sc} 134/\underline{R}^r$	5.10
$\underline{R}^{sc} 134/\underline{R}^r$	5.16
$\underline{R}^{st}/\underline{R}^r$	2.99
$\underline{R}^{st}/\underline{R}^r$	3.66
$\underline{R}^r/\underline{R}^r$ (Control)	5.89

*Based on scores of 300 individual kernels (50 kernels from each of 6 testcross ears in each male family).

These data show that the \underline{R}^{nj} mutant is paramutagenic, and is significantly more paramutagenic than the $\underline{R}^{sc}134$ parent allele. There have been few instances in which a mutant allele at the \underline{R} locus has been more paramutagenic than the parent allele. In the present sequence both the observed mutation events involved coincident alteration of \underline{R} locus phenotype and level of paramutagenicity. In the Navajo mutant full paramutagenicity is restored, and this observation lends support to the idea that in certain self-colored (\underline{R}^g) mutants derived from \underline{R}^{st} , the unaltered genetic region determining paramutagenic action is suppressed by an extragenic element.

K. S. McWhirter

3. A dominant partial inhibitor of yellow endosperm.

A dominant gene which acts as a partial inhibitor of \underline{y} (yellow endosperm) has been isolated from Dr. A. L. Hooker's Source A Helminthosporium turcicum resistance stock. One plant from this stock, when crossed with W22 ($\underline{ACr}^g/\underline{ACr}^g$, $\underline{Y}/\underline{Y}$), produced a progeny in which half the plants segregated $\bar{3}$ dark yellow: 1 white endosperm, on selfing, and half the plants segregated dark yellow, pale yellow and white endosperm kernels, on selfing. On the latter ears the kernel types occurred in the ratio of 9 pale yellow: 3 dark yellow: 4 white. The segregation totaled for samples from 10 ears was:

1057 pale yellow: 331 dark yellow: 416 white.
 Segregation (χ^2 (2d/f) = 4.63, P = 0.20; heterogeneity
 χ^2 (16 d/f) = 14.1, P = 0.50).