

2. Mutation of a self colored allele to a Navajo pattern.

A mutation study involving 98 self colored R alleles (designated  $\underline{R}^{sc}$  from  $\underline{R}^{st}$ , or  $\underline{R}^{sc1}$  from light stippled) derived by mutation from stippled was begun in 1959. The object was to study the mutation spectrum of  $\underline{R}^{sc}$  alleles, and to determine whether mutability was related to the paramutagenic action of the allele.

Eighteen independent mutants from  $\underline{R}^{sc}$  alleles were established, of which 10 were based upon the selection of mutant kernels which were initially completely colorless. The progeny tests show, however, that only one of these is a completely colorless mutant. Three are near-colorless, 3 are weakly pigmented (diffuse patches) and 3 are "pale spotted," dosage-dependent alleles.

From 8 presumed mutant kernels which initially showed some pigmentation of the aleurone, 3 weakly pigmented mutants, one "pale spotted" and 3 dosage-dependent self colored alleles were obtained. (The  $\underline{R}^{sc}$  parent alleles are dosage-independent.) The remaining pigmented mutant kernel had the Navajo phenotype, and its descendants gave the Navajo pattern. This mutant was derived from the cross  $\underline{R}^{sc1}134/\underline{R}^{sc1}134 \text{ } \eta \text{ } X \cdot \underline{r}^I \underline{r}^I \text{ } \sigma$ , and its origin by contamination is excluded. As expected, it is associated with green plant and seedling color (all  $\underline{R}^{sc}$  alleles are  $\underline{R}^S$  in Emerson's terminology).

No reverse mutations to a stippled allele were found, although the "near-colorless" and weakly pigmented alleles phenotypically resemble the  $\underline{r}^I$  alleles which Ashman (Genetics 45:18) obtained directly from stippled by mutation.

The over-all mutation rate was low; considering all mutants it was  $18/1,150,746 = 0.15 \times 10^{-4}$ .

There is no indication in the present data of a relation between the paramutagenic action of  $\underline{R}^{sc}$  alleles and mutability of these alleles. The number of mutants recovered is insufficient, however, to provide an adequate test of this question.

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3. Phenotypes of presumed mutant kernels from stippled in relation to germinal transmissibility.

Ashman's (Genetics 45:19) studies of the mutation of stippled to self colored demonstrated two points: