

3. Opaque-2 shrunken endosperm mutant.

In the M_2 generation of homozygous opaque-2, seed treated with a 0.0025M concentration of DES, upon selfing, showed segregation for shrunken endosperm. Out of 254 kernels, 197 were normal and 57 were shrunken suggesting a single gene mutation of normal Sh to sh (shrunken).

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4. Induction of mutations in a multiple stock with DES.

When about 100 seeds of a homozygous dominant multiple stock, Bm₂ Lg₁ A₁ Su₁ Pr Y₁ G1₁ J₁ Wx G₁, were treated with 0.006 M DES, two liguleless plants were observed in the M_2 , which may be due to a mutation at the Lg₁ locus. One of the two liguleless plants had a brown midrib, which suggests that simultaneous mutations occurred at two loci, Bm₂ and Lg₁.

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5. Induction of specific locus mutations by DES and hydrazine.

Seed of a multiple stock homozygous for gl₆ lg₂ a₁ et, A₂, Dt C, and R was pre-soaked for 24 hours prior to treatment with ten different concentrations of DES ranging from 0.003M to 0.01M for 8 hours. Out of total 739 treated seed, 541 germinated. Among the resulting population were plants with three types of chlorophyll sectors (yellow green, yellow, and albino) as well as 9 bifurcated and 14 trifurcated leaves. Pollen sterility was about 13% in the 0.003M treatment whereas in the 0.005M, it was about 24%. There seems to be an increase in percentage of pollen sterility with increase in concentration of DES treatment.

Out of 269 seedlings, five reversions from liguleless to normal were observed, two in the 0.003M, two in the 0.0035M, and one in the 0.004M treatment.

Seed of the homozygous multiple dominant stock, Bm₂ Lg₁ A₁ Su₁ Pr Y₁ G1₁ J₁ Wx and G₁, was treated with 0.009M hydrazine hydrate (80%) for 23 hours after one hour of pre-soaking. Two golden and two yellow

seedlings were observed in the M_1 . In the selfed progeny, a colorless sugary seed, which could be due to simultaneous mutations at three different loci \underline{A}_1 \underline{Y}_1 \underline{Su}_1 , and four normal colorless seeds, which could be due to simultaneous mutations at two loci \underline{A}_1 and \underline{Y}_1 , were observed. These observations suggest that hydrazine may induce recessive mutations at specific loci even in the M_1 .

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6. Position of the purple gene (Pr/pr) in gene action sequences of anthocyanin biosynthesis.

The U.V. absorption spectra of the alcoholic extracts of aleurone tissue of \underline{a}_1 , \underline{a}_2 , \underline{c}_1 , \underline{c}_2 , \underline{r} testers and homozygous double recessive mutants of \underline{a}_1 \underline{pr} , \underline{a}_2 \underline{pr} , \underline{c}_1 \underline{pr} , \underline{c}_2 \underline{pr} , and \underline{in} \underline{pr} were compared.

All the single and double mutant extracts gave the same absorption maxima, i.e. 320mu, 286mu, and 275mu, with the exception of \underline{a}_1 \underline{pr} and \underline{a}_2 \underline{pr} , which gave 308mu and 310mu respectively in addition to 286mu and 275mu. The spectral pattern of tissue extracts of \underline{pr} differs from \underline{Pr} extracts only in the \underline{a}_1 \underline{pr} and \underline{a}_2 \underline{pr} combinations whereas in combination with \underline{c}_1 , \underline{c}_2 , \underline{in} , and \underline{r} the pattern is the same. This might suggest that the $\underline{Pr/pr}$ locus actively controls the nature of the accumulated substance(s) only in \underline{a}_1 and \underline{a}_2 , if the spectral pattern and absorption maxima are controlled by the $\underline{Pr/pr}$ locus in the aleurone tissue. Thus, $\underline{Pr/pr}$ may act prior to \underline{A}_1 and after \underline{R} in the gene action sequence (MNL 36:62, 1962).

It is possible that the $\underline{Pr/pr}$ locus, which controls the hydroxylation of the B-ring, may not necessarily shift the observed absorption maxima and/or spectral pattern.

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7. Opaque-2 synthetic variety of maize.

Several Indian inbred lines were selected to incorporate the opaque-2 gene to develop hybrids (MNL 42:148, 1968). The yellow opaque-2