

3. Reduplication of Transposed Modulator in a Variegated Pericarp Strain.

A new variegated pericarp phenotype, termed "very light", appeared in an inbred line as a mutation from light variegated. The latter previously had been shown to differ from ordinary medium variegated in possessing a unit called transposed Modulator (tr-Mp) which markedly reduces the frequency of P^{VV} to P^{RR} mutations. Very light variegated was found to carry two doses of tr-Mp at different loci. The evidence makes it probable that the second tr-Mp unit in the very light variegated phenotype originated from a reduplication (and transposition) of the single transposed Modulator present in the light variegated parent. The formulae of the three classes of variegated pericarps mentioned above thus may be written:

P^{VV} = medium variegated

P^{VV} + 1 transposed Modulator = light variegated

P^{VV} + 2 transposed Modulators = very light variegated.

Determination of the number of changes of variegated to red of three size classes, namely, one kernel, one-half kernel, and one-quarter kernel, show that increasing doses of transposed Modulator reduce the frequency of P^{VV} to P^{RR} mutations exponentially. A single dose of tr-Mp (light variegated) as compared with the absence of tr-Mp (medium variegated) reduced the frequency of P^{VV} to P^{RR} mutations 59.7%. The corresponding value for two doses of tr-Mp (very light variegated) as compared with one dose, was a reduction of 86.8%. The extremely frequent, late-occurring mutations giving rise to very small ill-defined stripes and diffuse pigmentation characteristic of medium variegated, can not be detected in the light and very light variegated phenotypes.

R. A. Brink