

of these kernels. The one green seedling from the colorless kernel class started to develop pigment at the six leaf stage, and so may represent a mutation of the B gene.

Derek Styles

3. Interaction of modulator with stippled.

Following introduction of Mp into an Rst stock, several ears were observed carrying sectors of kernels with abnormal spotting patterns among the otherwise standard stippled kernels.

Three classes of abnormal stippled kernels, all with reduced amounts of pigmentation and designated Rst (1.st.), Rst (11.st.), Rst (coless), respectively, have been selected and further analyzed in order to determine:

1. If their phenotype reflects a change at the R locus or at Mst, a modifier of stippled 5.7 crossover units distal to the R locus, and
2. Whether alteration in paramutagenic capacity accompanied the change in stippled phenotype.

In regard to point 1, Table 1 indicates that the "abnormal stippled" kernels can be grouped into two classes:

(A) Rst (1.st.) and Rst (11.st.) are due to a change of the modifier Mst or to its transposition (see next report) and

(B) Rst (coless) reflects a change at the R locus.

The test of paramutagenicity indicated that Rst (1.st.) does not differ significantly from Rst (standard) in capacity to reduce R pigmenting potential.

Rst (11.st.) and Rst (coless) seemingly are more paramutagenic than Rst (standard). Additional data on this point, however, are needed.

The last finding suggests that paramutation and repression at the R locus exhibited by the Rst alleles and derivatives are not independent phenomena.

Table 1
 Test to Determine Whether the "Abnormal" Stippled
 Phenotype reflects a change at the R Locus or in the
 Modifier (Mst)

Test matings	Endosperm Genotypes and Phenotypes Predicted if Alteration is at:	
	(1) <u>Rst</u>	or (2) <u>Mst</u>
1. $r^r M^{st}$ x abnormal stippled	<u>r^r <u>M^{st}</u></u>	<u>r^r <u>M^{st}</u></u>
	<u>r^r <u>M^{st}</u></u>	<u>r^r <u>M^{st}</u></u>
	<u>$*(-)$ <u>M^{st}</u></u>	<u>R^{st} <u>$(-)*$</u></u>
	light stippled	standard stippled
2. abnormal x $R^{st} m^{st}$ stippled	<u>$*(-)$ <u>M^{st}</u></u>	<u>R^{st} <u>$(-)*$</u></u>
	<u>$*(-)$ <u>M^{st}</u></u>	<u>R^{st} <u>$(-)*$</u></u>
	<u>R^{st} <u>m^{st}</u></u>	<u>R^{st} <u>m^{st}</u></u>
	standard stippled	light stippled

* assumed site of alteration

Results of test matings

Cross made	<u>Rst</u> phenotype tested	# ears scored	Showing <u>Mst</u> change	Showing <u>Rst</u> change	Showing no change
g^{36} x g^9	<u>Rst</u> standard	11			11
g^{37} x g^9	<u>Rst</u> light st.	20	20		
g^{38} x g^9	<u>Rst</u> very light st.	12	12		
g^{39} x g^9	<u>Rst</u> standard	7	1		6
g^{40} x g^9	<u>Rst</u> light st.	9	9		
g^{41} x g^9	<u>Rst</u> very light st.	4	4		
g^{42} x g^9	<u>Rst</u> standard	1			1
g^{43} x g^9	<u>Rst</u> colorless	8		<u>8</u>	

Results of test matings continued

Cross made	R st phenotype tested	# ears scored	Showing M st change	Showing R st change	Showing no change
g ¹⁰ x g ³⁶	R st standard	6			6
g ¹⁰ x g ³⁷	R st light st.	5	5		
g ¹⁰ x g ³⁸	R st very light st.	6	6		
g ¹⁰ x g ³⁹	R st standard	3			3
g ¹⁰ x g ⁴⁰	R st light st.	9	9		
g ¹⁰ x g ⁴¹	R st very light st.	3	3		
g ¹⁰ x g ⁴²	R st standard	1			1
g ¹⁰ x g ⁴³	R st colorless	11		<u>11</u>	

g⁹ = Rst mst/Rst mst

g¹⁰ = r^r Mst/r^r Mst

Giuseppe A. Gavazzi

4. Further evidence for transposition of Mst, a modifier of the Rst phenotype.

Mst, a genetic element whose existence and phenotypic expression have been studied by Ashman (1962), lies 5.7 units distal to Rst. It increases the frequency of dark spots on the colorless aleurone background.

As indicated in the preceding report, M_p was introduced into a homozygous Rst/Rst inbred line in order to study the possible interaction of Rst with M_p.

When Rst/r^r, or derivative "abnormal stippled" heterozygotes with r^r, obtained after the aforementioned cross, were crossed with rg/rg, some of the resulting ears gave unexpected results. Besides 1/2 colorless kernels, which are genotypically r^r/rg, they carried two kinds of stippled kernels, dark and light, often in equal numbers. Similar results were previously observed by Ashman in two exceptional ears. They led him to the conclusion that Mst had transposed to a position in which it assort independently of Rst.