

UNIVERSITY OF WISCONSIN
Madison, Wisconsin

1. A plant color factor linked to the R locus.

From a stock of \underline{R}^r Ecuador, a non-paramutable \underline{R} allele of South American origin, a plant color factor, closely linked to \underline{R} , was isolated. The linked factor has the plant color attributes of \underline{R}^{ch} —i.e., the production of pericarp color in the presence of \underline{Pl} , concentration of anthocyanin at stem nodes, and production of pink silks. Another phenotypic effect of this factor is to produce red striping in leaves exposed to light, somewhat similar to the effect of \underline{B} (sun red).

From 1440 kernels resulting from crosses of the type: $\underline{R}^{st}\underline{M}^{st}/\underline{R}^r\text{-Ec } \underline{m}^{st} \times \underline{r}\underline{g}\underline{m}^{st}/\underline{r}\underline{g}\underline{m}^{st}$, 25 proved to be recombinants between \underline{R} and the leaf stripe factor (14 \underline{R}^r , no stripe; 11 \underline{R}^{st} , stripe). This places the factor 1.7 units from \underline{R} .

29 light-stippled (i.e., $\underline{R}^{st}\underline{m}^{st}$, crossovers between \underline{R} and \underline{M}^{st}) and 709 stippled ($\underline{R}^{st}\underline{M}^{st}$) kernels were produced from the above crosses. When the 29 $\underline{R}^{st}\underline{m}^{st}$ kernels were planted, of the 22 that germinated, 9 carried the leaf striping factor. The factor, therefore, is between \underline{R} and \underline{M}^{st} , and at a distance of about 1 or 2 units distal to \underline{R} .

R. A. Bray

2. A duplicate R locus.

An \underline{R} factor originally from Peru and sent us by P. C. Mangelsdorf under the designation Peru 1497, has been found to segregate independently of the known \underline{R} locus in chromosome 10. Plants heterozygous for both loci give ratios as expected for duplicate factors. By the use of inversions and the \underline{wx} -9 translocation series, the duplicate factor has been located on the second chromosome, probably near the \underline{B} locus. The data obtained were as follows:

I. $\underline{r}^g/\underline{r}^g; \underline{wx}/\underline{wx}$ ♀ X $\underline{r}^g/\underline{r}^g; \underline{Wx } 'R'/\underline{wx}$ T2-9b (2S.18, 9L.22) ♂

Kernel phenotypes from 5 plants

<u>Wx 'R'</u>	<u>Wx r</u>	<u>wx 'R'</u>	<u>wx r</u>
482	138	126	459

Recombination between $'R'$ and \underline{wx} on T2-9b : ca. 22%

II. $\underline{C}/\underline{c}; \underline{r}^r/\underline{r}^g; \underline{b} \underline{Gl}_2 \underline{R}'/\underline{B} \underline{gl}_2 \text{ Inv.2a}$ (2S.7, 2L.8) \otimes

Seedling phenotypes from colored kernels of five plants

<u>Non-glossy</u>	<u>Glossy</u>
-------------------	---------------

468	13
-----	----

Recombination between 'R' and gl₂ in Inv.2a : ca. 33%

III. $\underline{C}/\underline{C}; \underline{r}^g/\underline{r}^g; \underline{b}/\underline{b} \text{ ♀} \times \underline{C}/\underline{c}; \underline{r}^r/\underline{r}^g; \underline{b} \underline{Gl}_2 \underline{R}'/\underline{B} \underline{gl}_2 \text{ Inv.2a} \text{ ♂}$

Seedling phenotypes from colorless kernels of five plants

<u>Red B</u>	<u>Red b</u>	<u>Green</u>
--------------	--------------	--------------

441	3(1)	3(2)
-----	------	------

(1) these plants were classified as 'doubtful B'

(2) these could be contaminants

Recombination between 'R' and B in Inv.2a is a maximum of 3% from these data, and could be less.

'R'-Peru 1497, in plants that are r^g for the locus on chromosome 10, conditions colored aleurone, green anthers and seedlings, and is complementary to the aleurone factor C. There is no mottling of the aleurone when the factor is present in a single dose. There is no apparent reduction in the level of pigment after it has been in the same genome with a paramutagenic R gene. It is non-paramutagenic, in that R genes known to be paramutable remain apparently unmodified after they have been together with this duplicate factor for one generation.

Derek Styles