6. B' effect in the presence of a heterozygous translocation.

Plants from B'/B T2-9a x B are indistinguishable from B' plants derived from crosses without the translocation. T2-9a has breaks at 2S.36 and 9L.58, with the map location in chromosome 2 to the right of sk, according to one small test by Patterson (Newsletter 26:10).

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7. Bronze mutants and their action in anthocyanin synthesis.

The gene action sequence of A_1, A_2, C_1, R, In and Bz_1 in anthocyanin synthesis has been constructed, using complementary interactions between aleurone tissues (Newsletter 35:95). The position of action of bronze genes based on these observations was inconclusive. The bronze testers have anthocyanin pigment and when they are combined with colorless mutants, the colorless mutants develop pigment, leaving the possibility of simple diffusion of pigment rather than the required substrate transfer in anthocyanin synthesis. To eliminate this possibility of pigment diffusion, some further experiments were performed.

The double recessives r bz_1 and r bz_2 paired in the four possible combinations with singly recessive bz_1 and bz_2 were subjected to the previously described standard conditions. When colorless r bz_1 and r bz_2 are combined with bz_1 or bz_2 testers, only r bz_1 in the r bz_1:bz_2 pair develops pigment, while the others remain colorless, indicating that Bz_1 precedes Bz_2 in sequential action in anthocyanin formation and that the action of Bz_2 follows R and Bz_1 in anthocyanin synthesis. Further, double recessive bz_1 bz_2, although colorless, causes pigment to develop in a_2 and other testers, indicating that the bronze factors act after the others. These observations clearly show that the simple diffusion of anthocyanin pigment is not involved, at least from bronze mutants. Finally this method, i.e., use of double recessives, allows placement of the modifier genes in the action sequence in anthocyanin synthesis.

The action of C_2 in the sequence has not been established definitely as the c_2-mutant in some cultures gives pigment by itself. All these observations, including the previous findings, establish the following sequence:

C^I, C_1, R, (In), A_1, A_2, Bz_1, Bz_2 ----- anthocyanin

Some of the preliminary studies of extraction of substrates with various solvents, acetone, alcohol, acid-alcohol etc. toward the direct demonstration of gene-enzyme relationship are encouraging but not convincing. It is possible that the characterization of these substrates can be expected to reveal the intermediates and the reaction steps in the biosynthesis of anthocyanin and may lead to further analysis of the mechanism of gene action and interaction in this system.

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