

phenolic compounds in different parts of the maize plant. Standard organic extraction methods were used and thin layer and paper chromatography techniques were used for identification purposes. Such efforts concerning pollen indicated that quercetin and its 3-glucosylated form, isoquercitrin, were present in pollen with the exception that the anthocyanin mutant bz₁ did not possess isoquercitrin.

If this were true then it seemed quite reasonable that pollen should have an enzyme that could catalyze this reaction. However, efforts to obtain a protein extract after freezing the pollen with liquid air and grinding it with a mortar and pestle failed. If the enzyme could not be extracted, it seemed reasonable to use the whole pollen grain as a crude enzyme system. The reaction system used was typical for the study of such a reaction and included: MgCl₂, uridine-5'-diphosphate glucose (UDPG), quercetin, tris buffer (pH 7.4), distilled water, and whole pollen. Incubations were carried out at 37°C for three hours with shaking. The results of these studies indicated that the conversion was enzymatically catalyzed as the activity could be destroyed by heat, that the UDPG was required as a glucose donor, and that quercetin was required as a substrate. Although the conversion rate in the reaction is low, it is substantially larger than that for control reaction samples. To date the activity has been found to be stable on storage in vacuum in the deep freeze. Studies are in progress at the present time to relate this conversion to anthocyanin synthesis.

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8. Pollen: a crude enzyme system and genetic studies.

The results obtained in the studies discussed in the previous note strongly suggested further investigations to learn of any possible relationship of this reaction to the genetics of anthocyanin biosynthesis. This was possible since pollen samples were available having the following genes singly recessive: c₁, c₂, r, a₁, a₂, bz₁, bz₂, and pr. Conditions used for the different pollen samples were those given in the previous note. The results obtained indicated that bz₁ was indeed the gene responsible for the glucosylation reaction, as enzymatic activity was found in all mutant pollen except bz₁. Studies are presently in progress to investigate a possible gene dosage relationship using the homozygous recessive and dominant pollen for bz₁ as well as the heterozygote.

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9. Knotted leaf mutations.

Two different mutations for the knotted leaf character have been found during the past two years. One occurred in the inbred line Mol4W and the other in a commercial single cross. Both mutants appear to be dominant and similar in phenotype to the original knotted leaf. Allelism tests are in progress.

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