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1. The effects of anthocyanin (cyanidin di-glucoside) on root growth.

Snythetic anthocyanidins, especially 3,7,4 trihydroxy 2-phenyl benzopyrilium chloride and 7,4 dihydroxy 2-phenyl benzopyrilium chloride, have been reported to stimulate the growth of wheat roots (Stenlid, Physiol. Plant. 15: 1962). To determine whether or not anthocyanin is also a growth stimulator, cyanidin di-glucoside was extracted from 'cy' husks of maize, and tested for biological activity on seedling roots of wheat, oats, and maize; all three types of roots showed a statistically significant increase in length over the controls. The maize seedlings used for assay were homozygous for the a_1 gene. These data are being extended to include relative activities of pure preparations of cyanin, chrysanthemin and the aglycone, cyanidin. Responses to exogenous anthocyanin are also being determined for maize seedlings homozygous for a_1 and seedlings homozygous for A_1.

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2. Leucoanthocyanidin accumulation by maize.

Inter-tissue complementation studies with fresh aleurone tissue have suggested the following gene action sequence for the control of steps along a pathway leading to anthocyanin synthesis (Reddy and Coe, Science 1962):

$$(C^I)\text{-}C_1 - (C_2) - R - (In) - A_1 - A_2 - Bz_1 - Bz_2 \text{ -- Anthocyanin.}$$

In this sequence the homozygous a_2 mutant accumulates a leucoanthocyanidin which can be converted to anthocyanidin by heating with acidified-alcohol (Coe, Genetics 1955). If the gene order is true, mutants which block steps prior to the a_2 gene should lack leucoanthocyanidin when in combination with a_2. Those which block steps after the a_2 gene should have leucoanthocyanidin when in combination with a_2. Homozygous double mutant stocks in several combinations were kindly supplied by Dr. Coe. Extracts of the aleurone were tested for the presence or absence of leucoanthocyanidin. Pericarps were peeled from 10-30 mature seed of each genotype after soaking in water for one hour. The exposed endosperms were then extracted with acidified-alcohol for 24-48 hours at room temperature. Each extract was heated 2-5 minutes to detect visible evidence of conversion to pigment. All tests turned out as predicted (Table 1). Recessive intensifier (in) increased the