cinnamic acid (sinapic); 3,4-dihydroxy cinnamic acid (caffeic); and p-hydroxy cinnamic acid (p-coumaric), showing, thereby, the presence and activity of phenylalanine deaminase. The activity of this enzyme seems to be photocontrolled and is induced by phytochromes, resulting in absence of cinnamic acid in unexposed parts and an accumulation of aromatic amino-acids which could otherwise enter the anthocyanin biosynthetic pathway. The biosynthesis of anthocyanins in unexposed portions does not start even though phenylalanine is not lacking and the enzyme is also present, but the latter, being wavelength dependent, is activated only in the presence of light. This is further confirmed by the fact that the enzyme isolated from unexposed parts does not convert phenylalanine to trans-cinnamic acid during assay.

J. M. S. Mathur

Biosynthesis of anthocyanins in maize: Presence and role of transcinnamic acid-4-hydroxylase enzyme

The second step in biosynthesis of anthocyanins in maize is brought about through the agency of an enzyme, trans-cinnamic acid-4-hydroxylase, which catalyzes the formation of coumaric acid from trans-cinnamic acid.

The crude enzyme has been isolated by homogenizing 5 gm tissue with prechilled (-15 C) acetone, filtering in a Buchner funnel and suspending the acetone powder in cold 0.05 M phosphate buffer (pH 6.6), followed by centrifuging at 10,000xg for 30 min at 4C. The supernatant was used for assay and the activity was followed spectrophotometrically.

All the sun-exposed pigment-bearing portions of B pl plants show its presence in active form, accompanied by accumulation of substantial quantities of coumaric acid. The activity of this enzyme and presence of coumaric acid have not been observed in B pl x C-I hybrids, neither in vivo nor in vitro, although activity of phenylalanine ammonia lyase and presence of trans-cinnamic acids have been demonstrated.

These results further support the view that the dominant inhibitor C-I influences only the second step of biosynthesis in B pl plants and is incapable of blocking the first step of the biosynthetic pathway.

J. M. S. Mathur

Biosynthesis of anthocyanins in maize: Role of dominant inhibitor C-I

Since the dominant inhibitor C-I totally inhibits formation of anthocyanin in the aleurone layer, it was found to be excellent material to study gene action. By studying B pl and C-I (homozygous) and B pl x C-I hybrids (different tissues at different stages of development) both in vitro and in vivo, it was ascertained how C-I inhibits the biosynthesis of anthocyanins and at what stage this blockage occurs. The colored and colorless portions of B pl plants were examined for precursors (phenolic acids) in cob, silk, kernels, stem and colorless portions of leaves and so also in C-I plants. B pl plants showed the presence of the first compound of anthocyanin biosynthesis, cinnamic acid. The phenylalanine ammonia-lyase enzyme is present in all plant parts, and this converts the aromatic amino acid, phenylalanine, into trans-cinnamic acid; thus, biosynthesis of anthocyanins can proceed beyond the first step. However, we have found that the activity of this enzyme is wavelength dependent. This induction of biosynthesis through phytochromes results in formation of anthocyanins only in sun-exposed portions, and unexposed parts do not synthesize anthocyanins even though there is phenylalanine accumulation and enzyme is present. This is because the latter is in an inactive form. This is further confirmed by the fact that we have not been able to demonstrate the presence of trans-cinnamic acid in colorless unexposed portions.

In none of the plant parts from C-I have we been able to identify cinnamic acid or the activity of the enzyme, not even in the presence of light or at any devel-