

Inhibitory Effect of Anthocyanin Colors on Mutagenicity Induced by 2-Amino-1-Methyl-6-Phenylimidazo[4,5-b]Pyridine (PhIP)

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Summary

The potency on natural anthocyanin food colors, such as purple corn color (PCC), purple sweet potato color (PSPC) and red cabbage color (RCC), to modify the mutagenicity induced by the food mutagen 2-amino-1-methyl-6-phenylimidazo[4,5-b]pyridine (PhIP) was investigated using *Salmonella typhimurium* TA 98. These anthocyanin colors themselves did not induce the formation of revertants. These anthocyanin colors inhibited the reverse mutation induced by PhIP in the presence of rat liver microsomal activation systems (S-9 mixture) in a dose dependent manner. In particular, a high dosage of PCC completely cancelled out the genotoxic effects of PhIP. Cyanidin 3-glucoside, the anthocyanin pigment purified from PCC, was also effective in reducing the genotoxicity of PhIP, indicating that this anthocyanin pigment is the active principle. LC/MS analysis clearly showed anthocyanin colors inhibited the hydroxylation of PhIP by the S-9 mixture. Although molecular mechanisms need further investigation, their antioxidant activity is most likely related to the antimutagenic activity.