The Cytotoxic and Mutagenic Effects of Arsenic on Mammalian Cells and the Countering Antioxidant Effects of Caffeic Acid Phenethyl Ester and Turmeric

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Arsenic poisoning is extremely severe in regions of Bangladesh, where the arsenic concentration in the drinking water of some tube wells can be as high as 100 times more than the recommended safety level. Chronic exposure to high levels of inorganic arsenic can result in various health problems such as skin lesions, lung cancer, liver cancer and extreme kidney damage. The purpose of this study was to determine the antioxidant effects of curcumin (active ingredient in turmeric) and CAPE (Caffeic Acid Phenethyl Ester) on sodium arsenite induced cytotoxicity and mutagenicity through the use of clonal and mutagenesis assays. The results show that the co-treatment of mammalian cells with curcumin and CAPE significantly reduced the cytotoxicity and mutagenicity of arsenite. Curcumin and CAPE can be used as dietary supplements to prevent arsenite induced free radical damage. In addition to their effectiveness, these antioxidants are natural substances, inexpensive and easily accessible.

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