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Phenethylisothiocyanate: A potential anti-cancer agent from watercress

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Abstract

Phenethylisothiocyanate (PEITC) is an isothiocyanatefound in watercress as the glucosinolate, gluconasturtiin. The isothiocyanate is converted fromthe glucosinolateby intestinal microflora or when it comes into contact with myrosinaseduring the chopping and mastication of the vegetable. In *vivo* studies, PEITC manifested protection against chemically-induced cancers in various tissues. A potential mechanism of chemoprevention is by modulating the metabolism of carcinogens so as to promote deactivation. The principal objective of this study was to investigatein rats the effect of PEITC on carcinogen-metabolising enzyme systems such as sulphotransferase (SULT),*N*-acetyltransferase (NAT), glucuronosyltransferase(UDP) and epoxide hydrolase(EH) following exposure to low doses that simulate human dietary intake. Rats were fed for 2 weeks diets supplemented with PEITC at 0.06 µmole/g (Low dose, i.e. dietary intake), 0.6 µmole/g (Medium dose) and 6.0 µmole/g (High dose), and the enzymes were monitored in rat liver. At the Low dose, no induction of the SULT, NAT and EH was noted, whereas UDP level was elevated. At the Medium dose, only SULT level was increased, whereas; at the High dose marked increase in EH level was observed. It is concluded that the effects of PEITC on carcinogen-metabolising systems are dose-dependent. Increased levels of detoxification enzymes such as UDP, SULT and EH is the likely mechanism of the chemoprevention of PEITC.

Biography

Ahmad FaizalAbdullRazis has completed his PhD in Toxicology from the University of Surrey, UK in May, 2012. He is currently a Senior Lecturer at the Faculty of Food Science and Technology and teaching Chemical Safety of Food and also Food Toxicology at undergraduate level. His research interest is Food Carcinogen, Food Allergen and Cancer Prevention. Hehas published more than 10 papers in reputed journals and currently supervising three MSc students.