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Bacterial antimutagenesis by hydroxycinnamic acids from plant cell walls

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Abstract

We have determined the abilities of (*E*)-ferulic acid, (*E*)-*p*-coumaric acid and (*E*,*E*)-5-5-dehydrodiferulic acid to protect against different types of mutation in a simple bacterial model. These antimutagenic properties were compared with those of the related compound curcumin, and also with those of an extract containing hydroxycinnamic acids obtained by the saponification of the cell walls of wheat coleoptiles. Three known mutagens, bleomycin, hydrogen peroxide and 2-amino-3-methylimidazo[4,5-*f*]quinoline (IQ) were used to chemically induce reversion mutation, while the known antimutagen Trolox was used as a positive control. Both the pure hydroxycinnamic acids and the extract from the cell walls showed antimutagenic properties. It is known that hydroxycinnamic

acids ester-linked to plant cell walls can be released in the human colon by the action of microbial esterases. Providing the current data extrapolate to mammalian cells, they suggest that antimutagenic properties of hydroxycinnamic acids released from plant cell walls could play a role in dietary fibre protection against cancer.

Keywords

- 5-5-Dehydrodiferulic acid;
- Antimutagen;
- Curcumin;
- Dietary fibre;
- Ferulic acid;
- Hydroxycinnamic acid;
- *p*-Coumaric acid;
- *Salmonella*