In vitro binding of mutagenic heterocyclic aromatic amines by Bifidobacterium pseudocatenulatum G4.

ABSTRACT

Consumption of probiotics has been associated with decreased risk of colon cancer and reported to have antimutagenic/ anti-carcinogenic properties. One possible mechanism for this effect involves physical binding of the mutagenic compounds, such as heterocyclic amines (HCAs), to the bacteria. Therefore, the objective of this study was to examine the binding capacity of bifidobacterial strains of human origin on mutagenic heterocyclic amines which are suspected to play a role in human cancers. In vitro binding of the mutagens Trp-p-2, IQ, MeIQx, 7,8DiMeIQx and PhIP by three bacterial strains in two media of different pH was analysed using high performance liquid chromatography. Bifidobacterium pseudocatenulatum G4 showed the highest decrease in the total HCAs content, followed by Bifidobacterium longum, and Escherichia coli. pH affects binding capacity; the highest binding was obtained at pH 6.8. Gram-positive tested strains were found to be consistently more effective than the gram-negative strain. There were significant decreases in the amount of HCAs in the presence of different cell concentrations of B. pseudocatenulatum G4; the highest decrease was detected at the concentration of 10(10) cfu/ml. The results showed that HCAs were able to bind with all bacterial strains tested in vitro, thus it may be possible to decrease their absorption by human intestine and increase their elimination via faeces.

Keyword: Anti-carcinogenic; Anti-mutagenic; Heterocyclic aromatic amines; Bifidobacterium.