

Aflatoxin B1 and sterigmatocystin binding ability of lactic acid bacteria

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Abstract

Among mycotoxins, aflatoxins are the strongest natural genotoxins. Aflatoxin B1 (AFB1) is produced by *Aspergillus flavus* and *A. parasiticus* strains. Sterigmatocystin (STC) is a precursor of aflatoxin, a not well characterized mycotoxin with only few publications. For detoxification of already contaminated substances, specific bacteria might be the solution with toxin binding abilities. In our present projects, the AFB1 and STC binding ability of lactic acid bacteria is being studied.

For toxin adsorption studies strains of lactic acid bacteria were tested in MRS broth with 0.2 ppm AFB1 or STC. The binding abilities of the strains were determined after incubation from 10 min to 48 hours by measuring the toxin content of the centrifuged biomass by HPLC method with UV detection.

The best AFB1 adsorption ability was found for *L. plantarum* TS23, *L. paracasei* MA2 and *L. pentosus* TV3 strains, binding nearly 10% of the toxin. Interestingly, for STC the binding rate was more than 20%. Neither AFB1 nor STC influenced the growth of bacterial strains at the tested concentration. It was found that 2 days of co-incubation was not required to bind the toxin, after 10 minutes, almost the same binding values were obtained. Toxin binding was detected above 10⁷ cells/ml.

There is literature on AFB1 degradation by lactobacilli, but there is no published publication on STC binding. Beyond basic research, lactobacilli as active ingredients of a biological AFB1-binding preparation could be an important innovation in feeding.

Biography:

Ildikó Bata-Vidács has completed his PhD at the age of 31 in food sciences at Szent István University, Hungary. She works as a senior researcher at the Department of Applied and Environmental Microbiology, Agro-Environmental Research Institute, Budapest, Hungary. She has published more than 30 papers and book chapters in reputed journals, from which 15 are with impact factor, and has been serving as an editorial board member for *Acta Alimentaria*, a peer-reviewed international journal of food sciences.

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