Microbial cells are safer to use for decontamination of aflatoxin M$_1$ in milk

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Aflatoxin M1 (AFM$_1$) is one of the category 1 carcinogenic compound found in milk. AFM$_1$ is usually found in milk from animals fed on aflatoxin B1 (AFB$_1$) contaminated fodder. AFB$_1$ is converted in AFM$_1$ in liver and get absorbed into the milk during biosynthesis. AFM$_1$ is considered as one of the potential human carcinogen, cytotoxin, teratogenic and genotoxic agent. Various strategies including, microwave heating, pasteurization, sterilization, binding with clay and microbial cells have been adopted to degrade, decontaminate and removal of this toxic compound from milk. However, decontamination of AFM$_1$ by binding it with microbial cell culture and then removal by centrifugation is considered as the most effective. In the current study three strains of lactic acid bacteria, a yeast strain of *Saccharomyces cerevisiae* and a mixture of both were used to evaluate their binding potentials for AFM$_1$. Two different concentrations of AFM$_1$, 0.05 and 0.1 µg/l were spiked in milk samples in the presence of various concentrations and their combinations of microbial cells. The concentration of AFM$_1$ and microbes were found to significantly affect the binding potentials of microbes. *Saccharomyces cerevisiae*, *lactobacillus helveticus* and the mixture of microbes at the concentration of $10^{10}$ cfu/ml were found to be most effective for binding of AFM$_1$. The stability of the AFM$_1$-microbial-cell complex revealed safe usage of microbes for the reduction of AFM$_1$ levels up to harmless limits.

Biography

Muhammad Riaz is a Research Assistant Professor at the Department of Food Science and Technology, Sejong University, South Korea. He has completed his BSc and MSc Food Technology from National Institute of Food Science and Technology, University of Agriculture, Faisalabad, Pakistan. He holds PhD in Biotechnology from National Institute for Biotechnology and Genetic Engineering (NIBGE), Pakistan. He has worked as an Assistant Professor at the Institute of Food Science and Nutrition, Bahauddin Zakariya University, Pakistan. He has 12 years, professional research and teaching experience. He has published plenty of research articles in journals of international repute. He is working as an Associated Editor in *International Journal of Food and Allied Sciences*. He has been awarded Research Productivity Awards in 2011 and 2012 from Pakistan Council of Science and Technology. Currently he is working on the decontamination strategies of aflatoxin M1 in milk and assessment of microbial and other contaminants including heavy metals, aflatoxins, *E. coli*, Coliforms and Salmonella in food and food products.

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