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Probiotic lactic acid bacteria as a potential antioxidant agent for control fumonisin B1-induced hepatotoxicity and nephrotoxicity in rats

Amira A Abdellatef¹, Ashraf A Khalil¹ and Noha M Zahran²

¹City for Scientific Research & Technological Applications, Egypt

²Alexandria University, Egypt

Among liver and kidney diseases, mycotoxin contamination of feed and food has become a major concern because it can cause acute or chronic mycotoxicosis in animals and human. Fumonisin-B1 (FB1) is a mycotoxin pretended a great threat to animal and human health due to developing different types of cancers. A case study was conducted to evaluate the recovery efficiency of *Lactobacillus delbrueckii* and *Pediococcus acidilactici* (LAB) on the level of changes caused by FB1-treatment on lipid profile, malonaldehyde, nitric oxide, glutathione content, SOD activity, total antioxidant capacity, total oxidant status and oxidative stress index were determined. DNA fragmentation in liver and kidney tissues were assessed using DPA assay. The histopathological changes and in rat kidney and liver were also examined. After four weeks, the animals fed with FB1-contaminated diet showed a significant increase in oxidative stress markers and DNA fragmentation accompanied with significant decrease in GSH content, SOD activity and TAC in liver and kidney tissues. LDL+VLDL cholesterol, TG and TC were significantly increased, however the HDL-C, kidney and liver weight were significantly decreased in animals fed-FB1 in the different doses tested (T50, T100 and T200). In the same line, the histopathological examination of the livers and kidneys showed a series of morphological alterations, notably hepatic and renal lesions in rats' fed-FB1. Co-administration with LAB resulted in a significant improvement in all the tested parameters and the histopathological changes of the liver and kidney. This study suggests that both LAB strains have ameliorated effect and consequently may play a role as antioxidant agent to alleviate liver and renal damage associated with FB1-induced hepatotoxicity and nephrotoxicity in rats.

Biography

Amira A Abdellatef is currently a PhD student and has her expertise in microbial genetics. She has completed MSc in Genetics and Biotechnology from Alexandria University, Egypt. She has received CONACYT-scholarship, as a Pre-doctoral Researcher at CINVESTAV Institution, Mexico. Her research interests focused on microorganisms, including filamentous fungi, bacteria and yeasts. She is particularly interested in the physiology, biochemistry, molecular genetics and genomics of these organisms like the isolation and exploitation of derived microorganisms especially fungi and their associated toxins from different sources, their molecular identification, characterization of different enzymes and screening and producing antimicrobial compounds. She has co-authored many peer-reviewed articles and several poster/oral presentations at international and local conferences.

amiraabdellatef@hotmail.com

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