Antifungal attributes of Probiotic *Lactobacillus* isolated from traditional fermented foods

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Abstract

Cereals grains and their by-products being major ingredients of foods/feeds represent an excellent substrate for growth and reproduction of fungi and have serious consequences on the safety of foods and feeds. Fungal infestation and mycotoxin contamination in food/feed stuffs represent a serious problem because of the unpalatability of contaminated feed and because of the reduction in food and feed quality. The presence of mycotoxins in food/feeds decreases food intake and animal performance. Contamination by mycotoxigenic fungi and its mycotoxins affects both the alimentary and organoleptic characteristics of cereal-based food/feeds and cause a risk of mycotoxicosis. Also, the reason for major disease outbreaks in different community of people, farm animals such as poultry, horses, pigs, cattles etc. Management of fungal mycotoxins includes prevention, regulation, monitoring, avoidance, decontamination, detoxification, and animal treatments. Most physical and chemical methods to reduce mycotoxin concentrations in food or feed have shown to be rather un-effective or to be difficult to implement into the production process. Therefore, probiotic based broad antifungal approach would be the better alternative for the management of mycotoxigenic fungi and its mycotoxins. Since probiotic LAB species are afforded GRAS status and have positive influence on gastrointestinal tract of human and other consumer animals, they can be used in the control of mycotoxigenic fungi. The talk is about determining the antifungal activity of probiotic *Lactobacillus* against mycotoxigenic fungi *in vitro*. Both the isolate and its extracellular metabolites can be used to lower mycotoxin content in feed model when compared to the level mycotoxin of feed in control. Further, *in vivo* studies to know probiotic effects in degrading mycotoxins. Thus, probiotic strain mainly, *Lactobacillus* can be used in formulation of a functional feed owing to its beneficial attributes.

Image

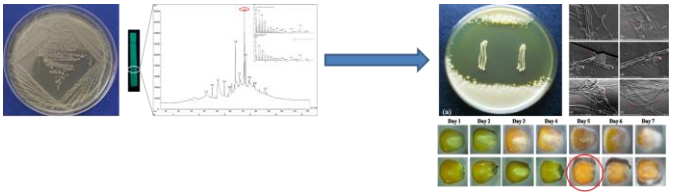


Figure 1: Effects of Lactobacillus and its metabolites in biocontrol of mycotoxigenic fungi and also its mycotoxins

Recent Publications

1. Poornachandra Rao, K., Chennappa, G., Suraj, U., Nagaraja, H., Charith Raj, A. P., and Sreenivasa, M. Y. (2015). Probiotic Potential of Lactobacillus Strains Isolated from Sorghum-Based Traditional Fermented Food. Probiotics Antimicrob. Proteins 7, 146–156. doi:10.1007/s12602-015-9186-6.
2. Deepthi, B. V., Rao, K. P., Chennapa, G., Naik, M. K., Chandrashekara, K. T., and Sreenivasa, M. Y. (2016). Antifungal attributes of Lactobacillus plantarum MYS6 against fumonisin producing Fusarium proliferatum associated with poultry feeds. PLoS One 11, 1–22. doi:10.1371/journal.pone.0155122.
3. Deepthi, B. V., Somashekaraiah, R., Poornachandra Rao, K., Deepa, N., Dharanesha, N. K., Girish, K. S., et al. (2017). Lactobacillus plantarum MYS6 ameliorates fumonisin B1-induced hepatorenal damage in broilers. Front. Microbiol. 8, 1–14. doi:10.3389/fmicb.2017.02317.
4. Poornachandra Rao, K., Deepthi, B. V., Rakesh, S., Ganesh, T., Achar, P., and Sreenivasa, M. Y. (2019). Antiaflatoxigenic Potential of Cell-Free Supernatant from Lactobacillus plantarum MYS44 Against Aspergillus parasiticus. Probiotics Antimicrob. Proteins 11, 55–64. doi:10.1007/s12602-017-9338-y.
5. Somashekaraiah, R., Shruthi, B., Deepthi, B. V., and Sreenivasa, M. Y. (2019). Probiotic properties of lactic acid bacteria isolated from neera: A naturally fermenting coconut palm nectar. Front. Microbiol. 10, 1–11. doi:10.3389/fmicb.2019.01382.Harper C (2009) The neuropathology of alcohol-related braindamage. Alcohol Alcohol 44:136-140.



Biography

Dr. M.Y. Sreenivasa has his expertise in the field of Probiotics and Mycotoxicology. He has over 16 years of post-graduate teaching experience at DOS in Microbiology, University of Mysore. He has many **International Awards such as** Shastri Indo Canada fellowship awarded by Shastri Indo-Canadian Institute to visit University of Ottava, Ottava, Canada during 2017. Raman Post-Doctoral Fellow to carry out post-doctoral research in University of Arkansas, USA during 2013 and QEP International Faculty Development award 2010 awarded by the Kennesaw State University, Georgia, USA in recognition of Indo – US Research collaboration during 2011. He has seven papers presented at national/international conferences and proclaimed best paper presentation/best poster awards.

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