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Division: Food Microbiology

Antifungal and Antiaflatoxic Properties of *Lactobacillus* Species

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Abstract Body:

Molds play an important role in spoilage of food products. It is estimated that 5 to 10% of the world food's production is lost due to fungal contamination. Further, certain fungal species produce highly toxic metabolites designated as mycotoxins. According to FAO, up to 25% of the world's food crops have been estimated to be significantly contaminated with mycotoxins. Among all known mycotoxins, aflatoxins are the most relevant ones because they are carcinogenic.

Biopreservation, defined as the control of one organism by another, has received much attention by researchers in recent years. In this field, lactic acid bacteria (LAB) are of great interest to be used as natural biopreservatives of food and feed since they have extensive probiotic properties and have been traditionally used in fermentation processes.

The aim of this work is to demonstrate the potential of *Lactobacillus* species to control the occurrence of aflatoxigenic fungi and aflatoxins in agricultural commodities. For that several aflatoxigenic species such as *Aspergillus flavus*, *A. parasiticus*, *A. nomius*, *A. tamari*, *A. arachidicola*, and *A. minisclerotigenes* were inoculated in triplicate in MEA supplemented with 10% of sterile supernatants of different *Lactobacillus* species obtained from liquid MRS cultures. Supernatants of most active strains inactivated with heat, proteases and NaOH (for pH neutralization) were also tested and compared with untreated ones. The fungal radial growth and the aflatoxin concentration produced in each plate were recorded and compared.

L. casei and *L. plantarum* supernatants were found to be most active. Growth of *Aspergillus flavus* in MEA after 7 days was reduced approx. by 31% and 25%, respectively for each bacteria. Aflatoxins B₁ and B₂ production were inhibited approx. by 97 and 87%, respectively. The antifungal and antiaflatoxic activity of those strains was reverted when supernatants were treated with proteolytic enzymes or their pH adjusted to 7.

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