

ISOLATION OF LACTIC ACID BACTERIA FROM FAECES OF PIGS AND THEIR ANTAGONISTIC EFFECTS ON THE GROWTH OF TOXIN PRODUCING *ASPERGILLUS FLAVUS* STRAINS

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Introduction

Mycotoxins are toxic byproducts of molds that pose risks to human health, animal well-being, and agricultural productivity. To combat mycotoxin contamination, the use of lactic acid bacteria with mold-inhibiting properties can be employed to suppress mold growth and subsequently reduce mycotoxin production. The objective of this study was to increase the diversity of lactic acid bacterium strains in the laboratory by collecting samples from pig faeces. Pigs were selected as the animal source due to their potential exposure to mycotoxins in their diet. By expanding the collection of lactic acid bacterium strains from pig faeces, this research aimed to explore new possibilities for mitigating mycotoxin contamination and improving food and feed safety.

Methods

Samples were isolated using classical microbiological methods, and then the identification of the isolates was done by molecular microbiological methods (genomic DNA extraction, repetitive PCR (rep-PCR), 16S rDNA PCR). Also, the investigation of the possible inhibitory effect of lactic acid bacterium strains on aflatoxin B1-producing *Aspergillus flavus* strains was carried out. For this, agar diffusion method was performed. All isolated strains were grouped based on the patterns obtained using rep-PCR, so only 2-3 strains per group needed to be sequenced.

Results

The 72 isolates belonged to 10 different species (Figure 1). The most strains belonged to the genus *Lactobacillus*: *Ligilactobacillus salivarius* 17%, *Lactobacillus amylovorus* 12%, *Lactiplantibacillus plantarum* 10%, *Lactobacillus reuterii* 8%, *Ligilactobacillus agilis* 5%, and *Lactobacillus brevis* 3%. Enterococci accounted for 20%: *Enterococcus hirae* for 12%, *Enterococcus faecium* for 5%, and *Enterococcus durans* for 3%. The remaining 18% was *Pediococcus pentosaceus*, and *Streptococcus alactolyticus* was identified at 7%.

Beside the isolation and identification of lactic acid bacteria from pig faeces, the other aim of this work was to study the effect of my lactic acid bacteria isolates on the growth of a toxin-producing *Aspergillus flavus* strain. Through their low molecular weight metabolic products, several strains of lactic acid bacteria have been shown the ability to inhibit the growth and reproduction of other microbes. Lactic acid bacteria that impede mold growth can aid in mycotoxin reduction since a mold that cannot multiply cannot produce mycotoxin in a product.

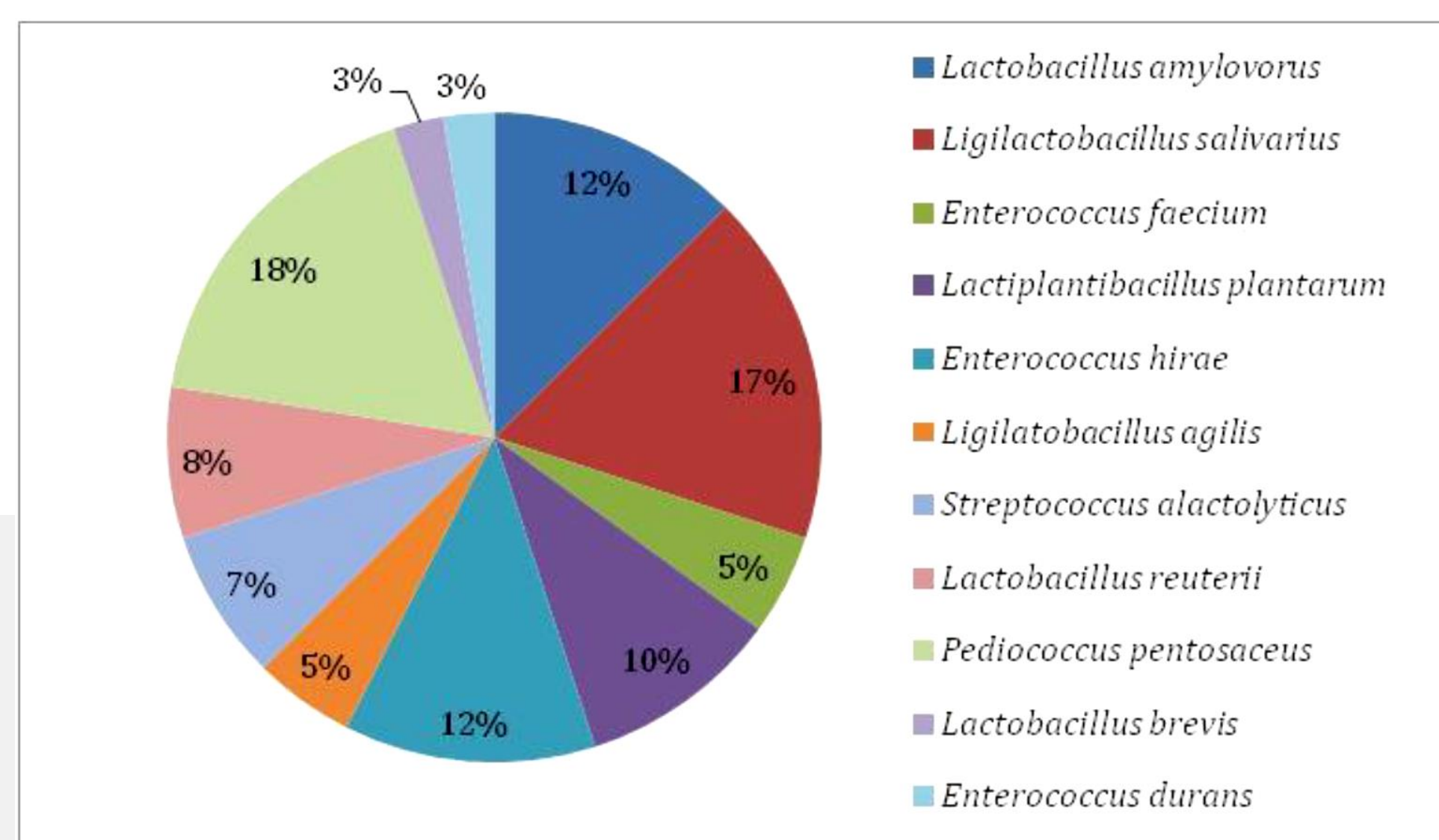


Figure 1. Dominant lactic acid bacteria of the pig microbiome isolated on MRS medium



Figure 2. Growth inhibition of *A. flavus* Zt41 by LAB strains (SR64, SR66, SR68, SR25)

Conclusion

Based on the results of these experiments, isolates *Lactobacillus salivarius* SR64, *Pediococcus pentosaceus* SR66, SR68, and *Lactiplantibacillus plantarum* SR25 had detectable growth inhibition abilities against aflatoxin B1-producing *Aspergillus flavus* Zt41 strain

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