

Impact of Probiotic Fermentation with Indigenous *Lactococcus lactis* LL16 on the Safety of Lithuanian Dried Chanterelles

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Introduction

- Fermented foods can offer improved microbial safety and functional properties
- Lactococcus lactis* LL16 is an indigenous probiotic strain obtained and isolated from raw Lithuanian milk
- Dried mushrooms are low in moisture, therefore we can improve their safety parameters using fermentation.

Aim

To investigate how fermentation with *Lactococcus lactis* LL16 affects the microbial safety of Lithuanian dried chanterelle mushrooms.

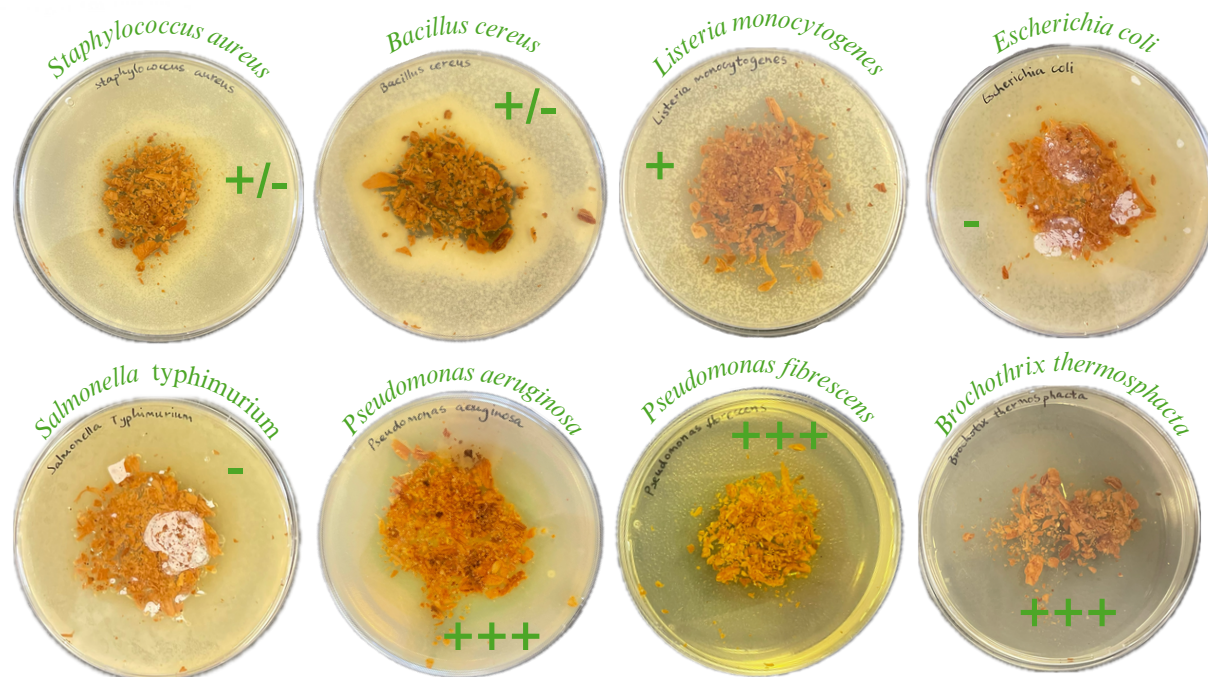
Methods

The chanterelles were handpicked, dried, homogenized, and sterilized before use. For solid-state fermentation, the chanterelle powder was mixed with sterilized water (ratio 1:2 w/w), inoculated with a 9.0 log₁₀CFU/mL bacterial concentration of revitalized *L. lactis* LL16 (previously isolated from locally sourced raw bovine milk, GenBank: JARHUB000000000). Non-fermented chanterelle mushroom powder served as the control.

Results

LAB counts were determined by plating and counting, and were significantly increased in the fermented samples (7.42 ± 0.00 Log CFU/g) in contrast to being undetectable in the non-fermented control. These results correlated with a significant pH decrease in the fermented sample (from 6.03 ± 0.02 to 5.64 ± 0.20).

Antimicrobial activity was assessed by agar diffusion against 8 common foodborne pathogens. The zones of inhibition were scaled from – to +++. *Brochothrix thermosphacta*, *Pseudomonas aeruginosa*, and *Pseudomonas fibrescens* showed strong inhibition (+++), while *Listeria monocytogenes* showed mild inhibition (+), *Staphylococcus aureus* and *Bacillus cereus* showed very weak inhibition (+/-), and no visible inhibition occurred against *E. coli*, and *Salmonella typhimurium*.



Conclusion

These findings demonstrate that fermentation with *L. lactis* LL16, compared to the non-fermented control, effectively improves the microbial safety of dried chanterelles.