

# Isolation and characterization of the antibacterial and antifungal activity of Lactic Acid Bacteria

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## INTRODUCTION

Lactic acid bacteria (LAB) which predominantly include the lactobacilliales order are found in biological and food systems and have an important involvement in the production of dairy foods. LAB contribute to the development of flavor, aroma and color, among other desirable sensorial characteristics (Tulini et al. 2015).

LAB strains are also known to produce additional metabolites in addition to lactic acid. These secondary metabolites have a specific and beneficial characteristics, such as prebiotics for other microorganisms and antimicrobial peptides that could inhibit the growth of spoilage and pathogenic microorganism (Papagianni 2012).

Furthermore, the dairy industry faces frequently contamination of products with a variety of molds like *Aspergillus*, *Penicillium*, *Fusarium*, *Rhizopus* and *Mucor* which are the cause of a tremendous economical loss (Batish et al. 2008); however, Crowley and others have discovered LAB strains with antifungal effect where their metabolites such as acetic acid share a synergistic effect with lactic acid interrupting the fungal growth. This study seeks to isolate technologically important strains from an Appenzeller cheese and evaluate its antimicrobial and/or antifungal properties against common pathogens found in foods such as *Escherichia coli*, *Bacillus amyloliquefaciens*, *Listeria innocua*, *Staphylococcus epidermidis*, yeasts as *Candida albicans* and mold as *Aspergillus fumigatus*.

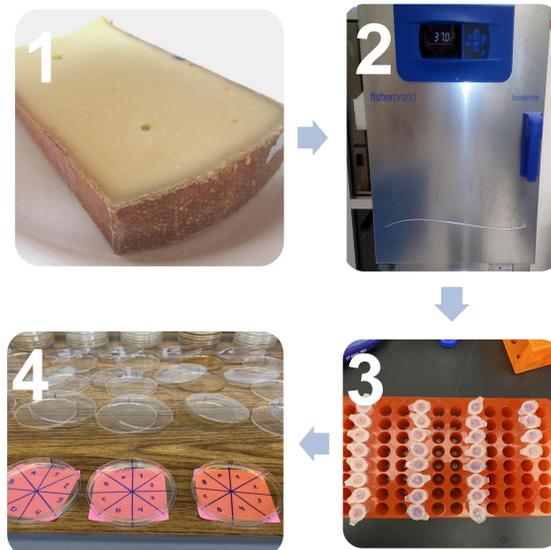
## HYPOTHESIS

The isolated LAB strains will contain antimicrobial and/or antifungal activity since

## AIM

The objective of the study was isolate lactic acid bacteria present in a swiss-like cheese and to evaluate antibacterial and antifungal activity against harmful microorganisms found in dairy products.

## MATERIALS AND METHODS

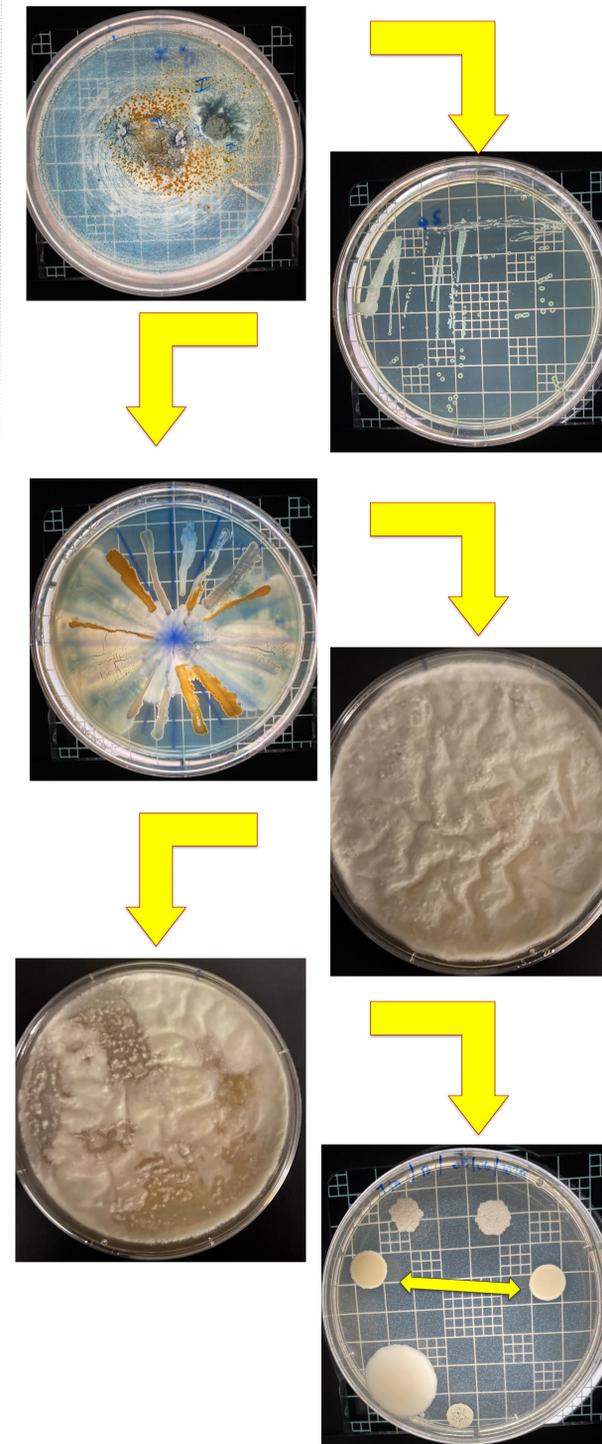


**Figure 1.** Procedure flowchart to evaluate the antimicrobial activity.

1. Isolation of LAB
2. Incubation of LAB at 37°C
3. Sample preparation
4. Assessment of antimicrobial activity

Randomized Complete Block Design (RCBD) with pathogens as block and isolated bacteria like treatment and 3 replicates.

## RESULTS



**Figure 2.** Dilution, isolation and antimicrobial activity.

## CONCLUSIONS AND DISCUSSION

- From the isolated strains 19% were not lactic acid bacteria
- One strain was found to have antimicrobial activity against four of the five (except *E. coli*) tested pathogens and *Aspergillus*.
- The inhibiting metabolite against the tested pathogens is not lactic acid.
- The antifungal activity was found both in the LAB strains as well as the non lactic acid producing strains.

## FUTURE WORK

- The isolated strains will be sequenced as well as the microbial community harboring the sample.
- Further testing will be done to find the metabolite responsible for inhibition of the microorganism tested

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