

CHAPTER 6

Conclusion and Future prospects

Chapter 6: Conclusion and Future Prospects

6.1. Conclusion

Assess the microbial flora from vaginal swabs of healthy reproductive-aged women (21-45 y)

- Seventy-four aerobic microbes were isolated from the vaginal swabs.
- Thirty-eight isolates were acidophilic and acid producing with potential pathogenicity.
- The aerobic isolates were identified as: *Enterococcus faecalis*, *Enterobacter cloacae*, *Shigella*, *Staphylococcus epidermidis*, *Escherichia fergusonii*, and *Candida albicans*
- Lactic acid bacteria were isolated from vaginal swabs on specific Lactic acid bacteria selective agar media in anaerobic/microaerophilic conditions.
- Three strains of LAB viz: *L. crispatus*, *L. gasseri*, and *L. vaginalis* were isolated.

Characterization of the isolated microbes and studying the interaction between *Lactobacillus* sp. and potential pathogens

- Potential pathogenic microbes displayed the production of various extracellular enzymes. They were mostly haemolytic, able to grow anaerobically, and possessed biofilm forming ability.
- *L. crispatus* was the only isolate to produce hydrogen peroxide, whereas *L. gasseri* showed better aggregation, co-aggregation, hydrophobicity, bile, and sodium tolerance property.
- *L. crispatus* and *L. gasseri* produced similar levels of lactic acid.
- *L. gasseri* showed the best inhibition of the potential bacterial pathogens followed by *L. crispatus*.
- CFS of *L. crispatus* was more potent against the potential bacterial pathogens.
- *L. gasseri* and its CFS showed the best inhibition of hyphae/biofilm formation of *C. albicans*

- The CFS produced by the LAB showed the presence of: SCFA, antimicrobial peptides, antibiotics, aldehydes, macrolides, terpenoids, hydroxy flavanone, cyclic hydrocarbons, benzoate esters, etc with antimicrobial potential

Exploit *Lactobacillus* sp. and their culture free supernatant for future industrial usage

- Lyophilized *L. crispatus* retained its revival potential for 36 months following storage at 12 °C.
- The *L. crispatus* was also successfully encapsulated into CMC-Alginate beads that could be utilized as an eco-friendly sanitary absorbent with viable LAB for 30 days.
- The CFS acted as a potent spray in controlling the biofilm formation of the microbial consortia on regular use.
- The CFS was also imbibed into the sanitary fabric and showed its potential for use as an additive in sanitary suppositories without diminishing the utility of the fabric.

6.2. Future Prospects

- A correlational study of the shuffling of vaginal microflora with the monthly hormonal cycle would improve the understanding of the vaginal microflora.
- Study of the vaginal microflora of menstruating women would help to understand the microbial population and density of LAB harboured during this period.
- Efficacy of isolated LAB and CFS metabolites against other vaginal pathogens is essential to understand their true potential.
- To study the impact of LAB and CFS metabolites on the vaginal epithelium *in-vivo* and *in-vitro* for their commercial and industrial use.