Title: PROBIOTIC POTENTIAL OF *Lactobacillus* REFERENCE STRAINS AGAINST GENITAL PATHOGENS

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Abstract:

In the female genital tract, the lactobacilli are the predominant microrganisms, and considered responsible for maintaining homeostasis. Due to high prevalence of vaginitis, vaginosis as well as the resistance of microrganisms to several antimicrobial agents, alternatives that can help to control these infections are necessary. Thus, this study aimed to investigate whether some reference strains presented probiotic characteristics against genital pathogens. Studied strains of lactobacilli, including *Lactobacillus acidophylus*, *L. brevis*, *L. d. delbrueckii*, *L. fermentum*, *L. paracasei*, *L. plantarum* and *L. rhamnosus*. The reference strains of pathogens studied were *Candida albicans*, *Neisseria gonorrhoeae* and *Streptococcus agalactiae*. Several parameters were investigated such as the ability to adhere to HeLa cells, the production of substances with antimicrobial activity, coagregation assays, biofilm production, cell surface hidrophobicity and the ability to inhibit the pathogen adhesion to mucin by exclusion and displacement. Overall, all lactobacilli adhered to mucin, and were able to coagregate with all tested pathogens and to produce metabolites with antimicrobial activity. Whilst only *L. fermentum* produced a moderate biofilm. All lactobacilli species, except *L. acidophylus* and *L. paracasei*, were able to adhere to HeLa cells. The exclusion assay revealed that *C. albicans* and *S. agalactiae* incubated with lactobacilli, presented with increased adhesion (2-6-fold increase) when compared to their respective controls (single-cultured pathogens) ($p < 0.05$; $p < 0.01$ and $p < 0.001$, respectively). However, no differences in adhesion were observed for *N. gonorrhoeae* ($p = 0.42$). Data obtained from the displacement assay showed that *C. albicans* was displaced by all lactobacilli strains ($p<0.001$), probably due to the production of substances with antimicrobial activity. No changes were observed for *S. agalactiae* and *N. gonorrhoeae* in this assay ($p = 0.51$ and $p = 0.36$, respectively). Of all lactobacilli studied, *L. brevis*, *L. fermentum*, *L. plantarum* and *L. rhamnosus* presented the most significant results, especially *L. fermentum*. Overall, our data suggest that the lactobacilli species studied herein, are potential candidates as probiotics.

Keywords: Probiotics. *Lactobacillus*. Genital pathogens. Vaginits. Vaginosis.

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