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Growth Inhibition of Candida Albicans Strains Co-Cultured with Lactobacillus Strains in a Cereal Medium

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Abstract : Candida albicans naturally occurs in the gastrointestinal tract (GIT) of more than 50% of humans. Overgrowth of the fungus causes several forms of candidiasis including oral thrush. Overgrowth tends to occur in immunocompromised humans such as diabetic, cancer and HIV patients. Antifungal treatment is available, but not without shortcomings. In this study, inhibitory activity of five probiotic Lactobacillus strains was demonstrated against the growth of seven clinical strains of Candida albicans by co-culturing of the organisms in a maize gruel (MG) medium. Phenotypic tests, molecular techniques and phylogenetic analysis have enabled precise identification of the organisms used in the study. The quantitative pour plate technique was used to enumerate colonies of the yeasts and the lactobacilli and the Kruskal-Wallis test and ANOVA tests were employed to compare the distributions of the colonies of the organisms. The cereal medium, containing added carbon sources, was inoculated with a Candida and a Lactobacillus strain in combination and incubated at 37 °C for 168 h. Aliquots were regularly taken and subjected to pH determination and colony enumeration. Certain Lactobacillus strains proved to be inhibitory and also lethal to some Candida albicans strains. A low pH due to Lactobacillus acid production resulted in significant low Candida colony counts. Higher Lactobacillus colony counts did not necessarily result in lower Candida counts suggesting that inhibitory factors besides low pH and competitive growth by lactobacilli contributed to the reduction in Candida counts. Such anti-Candida efficacy however needs to be confirmed by in vivo studies.

Keywords : candida albicans, oral thrush, candidiasis, lactobacillus, probiotics
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