Invitro Synergistic Antimicrobial Activity of Bacteriocin of Vaginal Lactobacilli and Antibiotics against Pseudomonas Aeruginosa

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Abstract

Pathogens resistant to most conventional antibiotics warrant the need to discover novel antimicrobials and develop innovative strategies to combat them. The aim of this study was to assess the in vitro antimicrobial activities of bacteriocins in culture supernatants of vaginal Lactobacilli alone or in combination with conventional antibiotics against Salmonella typhimurium, Pseudomonas aeruginosa, Escherichia coli, Shigella flexineri, Klebsiella pneumonia, Streptococcus epidermidis and Staphylococcus aureus. Forty two Lactobacilli isolates obtained from vaginal swab samples of 21 healthy human females were screened for their bacteriocin-secreting potential by using agar gel diffusion assays. Twenty three percent of the isolates exhibited bacteriocin-like antimicrobial activities against at least one indicator strain. However, one of the isolate exhibited broad spectrum antimicrobial activity by inhibiting both gram positive (S. epidermis and S. aureus) and gram negative pathogens (E.coli, P. aeruginosa and S. flexneri). The bacteriocin synergized the antimicrobial activities of the antibiotics viz. ciprofloxacin, streptomycin, moxifloxacin and rifampicin against P. aeruginosa. Further, P. aeruginosa showed resistance to tetracycline at the dose of thirty microgm per ml, however tetracycline in the presence of bacteriocin-containing culture supernatant made P. aeruginosa susceptible to tetracycline. Thus, purified-bacteriocins or bacteriocin-secreting lactobacilli could be used as adjunct therapy to lower the current doses of antibiotics prescribed for the treatment of infectious agents and thereby counter the problem of antibiotic resistance.