

TITLE: PRODUCTION OF BACTERIOCINS BY PENICILLIN-RESISTANT *Enterococcus faecalis* CLINICAL ISOLATES

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ABSTRACT:

Enterococci are one of the dominant bacteria in human gastrointestinal tract. Despite of that, in the last decade, enterococci have become more recognized as emerging human pathogens. Enterococci are intrinsically resistant to several antimicrobial classes and show a great ability to acquire new mechanisms of resistance. As an additional virulence factor, some infection-derived *E. faecalis* isolates are also able to produce bacteriocins, defined as biologically active compounds displaying a bactericidal or bacteriostatic mode of action against the target cell. The aim of this study was to evaluate the production of bacteriocins by penicillin-resistant *E. faecalis* isolates. The penicillin-resistant *E. faecalis* isolates were recovered in previous studies conducted at a hospital, in Uberaba-MG. From these isolates, 31 were randomly selected and tested for the production of antibacterial compounds by spot-on-lawn assay. Presence of interfering factors and the sensitivity to proteinase K were evaluated. The inhibitory activity of the antagonistic compounds was determined against different bacteria. Bacteriocin production was evaluated along the growth curve of the producer cells, and the antimicrobial activity was determined in supernatant and pellet, using the agar well diffusion assay. Twenty eight strains (90,3%) showed antagonistic activity against the indicator bacteria tested, and the most promising isolates, identified as 20, 38, 157, 250, 269 and 313, were selected for the subsequent experiments. Neither presence of bacteriophage nor acid production was detected. All the antimicrobial compounds were sensitive to proteinase K, confirming the protein nature of such compounds. *E. faecalis* ATCC 29212 was the most sensitive bacteria, being inhibited by all bacteriocins produced by penicillin-resistant strains. Antibacterial activity was visualized in all growth stages of the producer cells, both in the supernatant and pellets of the cultures; however, for the isolates 20, 38, 269 and 313, the antibacterial activity increased with the incubation time, and the highest bacteriocin activity was observed in the supernatant of the stationary phase. Penicillin-resistant *E. faecalis* are able to produce bacteriocins active against other enterococci and staphylococci; the bacteriocins seem to be produced in a constitutive way, which suggests that the bacteriocin production can be advantageous for pathogenic bacteria during the infection process.

Key words: *Enterococcus faecalis*, bacteriocin, antimicrobial activity, virulence.

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