

***In vitro* synergistic effect of citral in combination with antimicrobial agents against *Enterococcus faecalis* STRAINS**

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Enterococci are microorganisms that cause serious nosocomial infections, especially in intensive care units. These bacteria are part of the intestinal microbiota of humans and animals, and are etiological agent of infections (e.g., endocarditis, meningitis, bacteraemia and septicaemia). This microorganism is characterized by intrinsic or acquired resistance to several antimicrobial agents such as β -lactams, clindamycin, trimethoprim, quinolones, aminoglycosides and glycopeptides and this fact increase morbidity/ mortality rate. The search for new antimicrobial agents is important as well as the establishment of alternative therapies in order to handle this kind of infection. Secondary metabolites of plants are promising to provide diverse bioactive compounds with antimicrobial activity. Few studies have been focused on the growth inhibitory activity of the monoterpenes against *Enterococcus faecalis* strains. Based on the above description, the aim of this study was to evaluate the antimicrobial activity of citral, linalool and four antimicrobials (ampicillin, gentamicin, linezolid e vancomycin) against ten strains of *Enterococcus faecalis* with a resistant phenotype previously determined by the disk diffusion method. Four *E. faecalis* (EF 07, EF 11, EF 13 e ATCC 51299) showed resistance to all antimicrobial agents tested. This strains were selected for the study of the interaction between citral and antimicrobial agents by the checkerboard method. The criteria used to evaluate the synergistic activity were defined by the fractional inhibitory concentration index (FICI). Among the monoterpenes citral was the most effective against *E. faecalis* strains. All *E. faecalis* strains were susceptible to citral as determined by the microdilution method. The FICI values ranging from 0.125 a 0.5, suggesting a synergistic interaction. The combination citral/gentamicin showed indifferent effect and citral/vancomycin showed the lowest FICI values. This study demonstrated that citral combined with beta lactamics and glycopeptides antimicrobials acts synergistically by inhibiting *E. faecalis* strains.

Key words: terpenes, citral, VRE, Fractional Inhibitory Concentration Index

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