TITLE: CINNAMALDEHYDE AND CARVACROL AS GROWTH INHIBITORS OF GRAM POSITIVE AND NEGATIVE PATHOGENIC BACTERIA

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ABSTRACT: The emergence of bacterial strains resistant to antibacterial drugs is a major challenge faced worldwide by health professionals and researchers in the field. Some species have recognized clinical importance, such as methicillin-resistant *Staphylococcus aureus* (MRSA), *Pseudomonas aeruginosa*, *Acinetobacter baumannii* and *Escherichia coli*, justifying research aimed at developing new drugs for therapeutic use on diseases caused by these bacteria. So, the search for new antimicrobials includes natural products such as essential oils and their main compounds such as carvacrol and cinnamaldehyde. The aim of this study was to verify the antimicrobial activity of carvacrol and cinnamaldehyde against MRSA ATCC 33591*, P. aeruginosa* ATCC 27853, *A. baumannii* ATCC 19606 and *E. coli* ATCC 43895 by determining the minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC), both values in µg/mL, using the Resazurin Microtiter Assay (REMA) methodology. In addition, we test too the synergism between antibiotics and the compounds by determining the survival curve or time kill curve, using 25% of the MIC of oxacillin plus 25% of the MIC of the major compounds for MRSA and 25% polymyxin B with the compounds for other bacteria and the combination between the compounds being 25% cinnamaldehyde plus 25% carvacrol. Cinnamaldehyde showed better antibacterial action with a MIC of 250 for MRSA; 500 for *P. aeruginosa*; 31.25 for *E. coli* and 250 for *A.baumannii*. For carvacrol, MIC was better for the *A. baumannii* strain (125). For MRSA the MIC was 250, *P. aeruginosa* 1000 and *E. coli* 62.5. We verified the synergism between drugs and compounds, with a bactericidal synergistic effect on *A. baumannii*, *E. coli* and bacteriostatic for MRSA and *P. aeruginosa*. There was also synergism between the products tested, with emphasis on the combination of carvacrol and cinnamaldehyde, which is bactericidal for most strains and bacteriostatic for P. aeruginosa. Cinnamaldehyde and carvacrol were effective against the bacterial strains proposed in this study, especially cinnamaldehyde, which showed better antibacterial action. Both compounds have potential for the development of a new antimicrobial.

Keywords: Synergism, *P. aeruginosa*, MRSA, *E.coli, A. baumannii*, Essential oils.

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