



BACTERIAL DISEASES

BBD-044

COMBINED EFFECT OF GENTAMICIN AND OXYTETRACYCLINE WITH ESSENTIAL OILS AND THEIR MAIN COMPONENTS AGAINST RESISTANCE *STREPTOCOCCUS SUIIS* STRAINS

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Introduction

Streptococcus suis is an important pig pathogen with zoonotic potential. The control of the diseases caused by this microorganism is based on antimicrobial therapy. Actually, an important pressure to reduce the use of antimicrobials in pig farms exists, one of the strategies proposed is the combination of antimicrobials (AMB) with Essential Oils (EOs). The evaluation of the effectiveness of the combination of Gentamicin (GEN) and Oxytetracycline (OXI) with cinnamon, oregano, common thyme and red thyme EOs and their main components (cinnamaldehyde, carvacrol and thymol) against resistant strains of *S. suis* is the main objective of this work.

Material & Methods

Five resistant *S. suis* strains to GEN or OXI drugs were used, by the Checkerboard method. From the best combination that inhibited the bacterial growth, fractional inhibitory concentration index (FIC_{index}) was determined. A synergistic effect was considered when FIC_{index} ≤0.5; Additive >0.5-1; Indifferent >1 <2; and antagonist when FIC_{index} ≥2.

Results

No antagonistic effect was detected to any of the *S. suis* strain. The best combinations were detected between Gentamicin and each of the four EOs analysed with synergistic (FIC_{index} 0.375-0.5) and additive effects (FIC_{index} 0.563-1.0). For oxytetracycline, the best results were obtained with cinnamon, with synergistic effect in 2/5 assays and additive in the remaining (3/5). A decrease in the MIC of both products, up to 2-16 for AMB and 2-8-fold for EO was observed.

Discussion & Conclusion

In general, better results were obtained when combining the conventional AMB with EO than with its main component. These differences could be explained by the variety of mechanisms of action attributable to the Essential Oil compounds and the possible synergism between them. Our results could be of interest for future options of combined treatment of this antibiotic with essential oils against diseases produced by *Streptococcus* species.