

BBD-PP-52

TITLE

COMPARATIVE STUDY OF ANTIMICROBIAL ACTIVITY OF OREGANO OIL AND CARVACROL AGAINST STREPTOCOCCUS SUIIS

Fabiana Carolina de Aguiar¹, Ana Lucía Solarte¹, Lidia Gómez-Gascón¹, Carmen Tarradas¹, Alfonso Maldonado¹, Fernando Cardoso-Toset², Rafael Astorga¹, Belén Huerta¹

¹ *Animal Health Department, University of Córdoba, International Excellence Agrifood Campus 'CeIA3', 14071, Córdoba, Spain*

² *CICAP – Food Research Centre, 14400, Pozoblanco, Córdoba, Spain*

CONTENT

Background and Objectives

Streptococcus suis is an important pig pathogen and a serious professional zoonosis. The control of this disease should focus on the correct use of traditional antimicrobials, as well as new alternatives such as the use of natural products, including oils and extracts derived from plants. The objective of this study was to compare the antimicrobial activity and bactericidal dynamics of oregano essential oil and its main active component (carvacrol) against strains of *S. suis*.

Material & Methods

The distribution of the MIC and MBC was determined against 60 *S. suis* isolates. The MIC₅₀₋₉₀ and MBC₅₀₋₉₀ and the microcidal index (MBC/MIC) were also calculated and compared (Friedman and Wilcoxon tests, $P < 0.05$). Finally, the time-kill curve of European reference strain (*S. suis* P1/7) was determined at different times (0, 1, 5, 15 and 30 min and 1, 2, 4, 8 and 24 h).

Results

Carvacrol showed an inhibitory activity (MIC₅₀₋₉₀ of 156.25 μ g/ml) and bactericidal activity (MBC₅₀₋₉₀ = 156.25 - 312.5 μ g/ml) significantly higher than oregano (MIC and MBC 50-90 = 312.5 μ g/ml). In addition, to inhibit and eliminate more than 66% of the strains, a two-fold higher concentration of oregano was required, although we could verify the bactericidal character (microcidal index = 1 or 2) of both products. A concentration-dependent antimicrobial activity for oregano and carvacrol was showed, achieving a rapid bactericidal effect at supra-inhibitory doses (2 and 4 fold MIC), with virtual eradication of the bacterial population after 1-5 minutes of exposure.

Discussion & Conclusion

The results of this work suggest a greater antimicrobial potential of carvacrol than the oregano against *S. suis*. We consider that to potentiate the action and reduce the effective concentration of these products, one of the alternatives would be its combined use with antibiotics.