

3RD INTERNATIONAL CAPARICA CHRISTMAS
CONFERENCE ON
SAMPLE TREATMENT 2018

3RD - 6TH DECEMBER 2018 | CAPARICA, PORTUGAL

SUBJECTS

ANALYTICAL CHEMISTRY

SAMPLE TREATMENT FOR:

- INORGANIC AND ELEMENTAL ANALYSIS
- THE ANALYSIS OF ORGANIC MOLECULES
- PHYSICAL-CHEMISTRY ANALYSIS
- BIOMEDICAL ANALYSIS

AUTOMATIC METHODS (FIA-SIA)

CHEMOMETRICS

INFORMATICS

NANOTECHNOLOGY

INSTRUMENTATION

NEW TOOLS FOR SAMPLE
TREATMENT AND ANALYSIS

PROCEEDINGS
BOOK

VENUE:

HOTEL ALDEIA DOS CAPUCHOS GOLF & SPA

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Sample Treatment 2018 Proceedings Book

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SG 31 – Chemical characterization and antimicrobial activity of ozonized oil against methicillin resistant *Staphylococcus aureus*

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Abstract

Methicillin resistant *Staphylococcus aureus* (MRSA) are frequently found in infected skin wounds due to the exposure of deep tissues to the bacteria, in particular in infected diabetic foot ulcers in which the prevalence can be between 15 to 40% [1]. Clinical MRSA are usually resistant to most classes of antibiotics and, therefore, it is necessary to investigate new antimicrobial agents. Ozone has a recognized bactericidal activity and has been widely used as a clinical therapeutic agent for chronic wounds, such as, ulcers and other diabetic lesions, due to its wound healing ability [2]. This study aimed to characterize ozone oil suspensions and their activity against MRSA isolated from infected diabetic foot ulcers. Six ozonized oils with different ozonization doses were tested by disk diffusion method. The oils were prepared from a 50:50 mixture of extra virgin olive oil and refined sunflower oil and submitted to a gas stream of O₂/O₃ mixture at a concentration of 75 µg/ml of ozone in continuous flow (4 L/min). The oil content in fatty acid methyl esters after ozonization were investigated using a Bruker® SCION 436-GC gas chromatograph equipped with a flame ionization detector (GC-FID). All ozone suspension oils tested showed antimicrobial activity against all strains. The ozone suspension oil with the highest ozonization dose originated clear zones with a maximum of 12 mm. Composition of fatty acids in ozonized oils showed gradual decrease in unsaturated fatty acids with gradual increase in ozone doses. Overall, there was a decrease in the total fatty acid investigated and an increase in the content of unknown oxidized fatty acid with the increase of ozonization period. Our results indicate that ozonized oils have a significant antimicrobial activity, however, it is still unclear which compounds may be responsible for the bactericidal action.

References

- [1] Cervantes-García E, García-González R, Reséndiz-Albor A, Salazar-Schettino PM. Infections of Diabetic Foot Ulcers With Methicillin-Resistant *Staphylococcus aureus*. *Int J Low Extrem Wounds*. 2015;14(1):44-49. doi:10.1177/1534734614564053.
- [2] Spadea L, Tonti E, Spaterna A, Marchegiani A. Use of Ozone-Based Eye Drops: A Series of Cases in Veterinary and Human Spontaneous Ocular Pathologies. *Case Rep Ophthalmol*. 2018;9(2):287-298.

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