

ANALYSIS OF ANTIMICROBIAL ACTIVITY OF α -PINENO and β -CITRONELLOL AGAINST *Escherichia coli* ESBL- PRODUCING

Authors: Santos, R. A.^{1,2}; Silva, R. L.¹, Nascimento, J. M.³, Brito, I. L. P.⁴, Pinto, V. P. T.¹, Barbosa, F. C. B.¹

Institution: ¹ UFC - Universidade Federal do Ceará – *Campus* Sobral (Avenida Comandante Maurocéllo Rocha Ponte, 100 - Derby - 62041-040 - Sobral - CE), ² INTA - Instituto Superior de Teologia Aplicada (Rua Coronel Antônio Rodrigues Magalhães, 359 - Bairro Dom Expedito Lopes - 62050-100 - Sobral – CE), ³ UVA - Universidade Estadual Vale do Acaraú (Av. da Universidade, 850 - *Campus* da Betânia - 62.040-370 - Sobral – CE), ⁴ SCMS - Santa Casa de Misericórdia de Sobral (Rua Antonio Crisóstomo de Melo 919, Centro - 62010-550- Sobral - CE).

Abstract:

Essential oils are complex compounds, volatiles produced as secondary metabolites by plant protection against bacteria, viruses, fungi and parasites; used since the Middle Ages as antimicrobial, anti-inflammatory and even as local anesthetics. The α -pinene is a bicyclic terpene that can be found in the essential oils of rosemary, cypress and *Pinus elliottii* in Brazil. The β -citronellol is a naturally occurring monoterpenoid acyclic alcohol various essential oils such as citronella oil. *Escherichia coli* is a Gram-negative bacillus, belonging to the family *Enterobacteriaceae*, multi-drug-resistant clinically important among immunocompromised patients in high-risk areas in hospitals, and may be β -lactamase producers of extended spectrum (ESBL). This study aimed to analyze the antimicrobial activity of α -pinene and β -citronellol compounds against nine strains of *E. coli* ESBL producers isolated from patients with nosocomial infection in the Santa Casa de Misericórdia de Sobral, from September 2014 to March 2015. For the analysis of antimicrobial activity, polystyrene plates bottom 96 wells "U" standardized according to the M7-A guideline 6th edition were used, each well of the plate was filled initially with 100 μ L of the bacterial suspension in BHI broth (2×10^6 CFU ml⁻¹). Then added another 100 μ L of α -pinene and β -citronellol compounds, by performing serial dilution to obtain the concentration (1000 to 31.25 μ L/mL) to give a final volume of 200 μ L. Then the plates were incubated aerobically for 24 hours (37°C). The evaluation of the bacterial growth was measured by ELISA with the aid of turbidity. After this period, we evaluated the bacterial growth. The results demonstrated no antimicrobial activity of α -pinene and β -citronellol compounds against the bacteria analyzed in the concentrations evaluated. Therefore more studies are necessary to evaluate the antimicrobial activity of these compounds against bacteria of different species and different concentrations.

Keywords: *Escherichia coli*, ESBL, α -pinene, β -citronellol.

Funding agency: Santa Casa Misericórdia de Sobral