

THE ANTIBACTERIAL ACTIVITY OF ROSEMARY ESSENTIAL OIL AGAINST Staphylococcus aureus

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Based on the resistance of some microorganisms and the antimicrobials existent, and also the current search for natural products with bioactive substances, the aim of this work was to evaluate the antibacterial capacity of the rosemary essential oil (*Baccharis dracunculifolia*) against the *S. aureus* strain. The experiment was conducted in the microbiology laboratory at UTFPR Campus of Dois Vizinhos, in March, 2017. The oil was extracted from the rosemary leaves, which has been cultivated in Canelinha-SC. It was taken through the steam drag method, where the composition was determined by high performance chromatography. The antibacterial activity was performed *in vitro* against the strains of *S. aureus* INCQS 00015, it has been supplied by the Oswaldo Cruz Foundation, evaluated the following essential oil concentrations: 400; 200; 100; 50; 25; 12.5; 6.25; 3.125; 1.56; 0.781; 0.390; 0.195 $\mu\text{L}\cdot\text{mL}^{-1}$. In order to determine the minimum inhibitory concentration (MIC) the method M07-A6 of 2015 from the CLSI was used. It was emulsified 400 μL of oil in 20 μL of polysorbate 80 and 580 μL of Mueller Hinton broth in the eppendorff tube. 100 μL of Mueller Hinton broth was added to the microplate wells and 200 μL of the oil dilution in the column 1, serial essential oil dilutions were then performed up to 0.097 $\mu\text{L}\cdot\text{mL}^{-1}$. It was added 100 μL of inoculum adjusted in 5×10^4 UFC $\cdot\text{mL}^{-1}$. The plates were incubated at 37°C for 24h. It was added 20 μL of the 2,3,5-triphenyltetrazolium in the proportion of 0.5% for 1h, after that, the MIC's readings were taken, in duplicate. The MIC was determined in 0,195 $\mu\text{L}\cdot\text{mL}^{-1}$ of the essential oil from the rosemary opposite to *S. aureus*. So, it can be considered a potent antibacterial *in vitro*. Probably the result is justified by the oil composition, mainly mono and sesquiterpenes. It is composed for: 17.5% cis;trans-nerolidol; 15.0% gamma-element; 10.5% D-limonene; 9.5% β -pinene; 9.7% caryophyllene; 1.6% α -caryophyllene; 8.5% spathulenol; 4.0% α -pinene; 1.5% β -myrene; 1.6% aromadendrene; 8.2% D-germacrene; 1.7% α -amorphene; 3.8% globulol; 4.0% α -cadinene; 2.5% epiglobulol. The essential oils accumulate in the lipid bilayer of the bacterial cytoplasmic membrane, probably because of the lipophilicity, by causing permeability variation and it results in the microorganism inhibition. As a result, it was concluded that the rosemary essential oil demonstrated antibacterial activity *in vitro* against the *S. aureus* strain, the MIC was determined in 0.195 $\mu\text{L}\cdot\text{mL}^{-1}$.

KEYWORDS: *Baccharis dracunculifolia*, bacteria, chemical components, *Staphylococcus aureus*.