

ACTION OF MELALEUCA AND CINNAMON ESSENTIAL OILS *IN VITRO* FOR THE CONTROL OF BOVINE MASTITIS

AÇÃO DE ÓLEOS ESSENCIAIS DE MELALEUCA E CANELA *IN VITRO* NO CONTROLE DA MASTITE BOVINA

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Abstract

Mastitis is a disease that mostly affects dairy cattle, harming animal welfare and increasing production costs due to the necessary treatment and loss of milk quality. It is mainly caused by *Staphylococcus aureus*, which as one of the most difficult microorganisms to eliminate, with high potential for contagion. One of the main problems is the resistance of these bacterial strains due to the indiscriminate use of antimicrobials. For this reason, alternative and sustainable methods have been sought, such as the use of essential oils (EOs) as a form of treating bovine mastitis. The objective of this study was to select different essential oils and evaluate their antibacterial activity *in vitro* against strains of *Staphylococcus aureus*. The experiment was carried out in the Chemistry Laboratory of IFES - Alegre Campus. Two different essential oils were used: melaleuca (*Melaleuca alternifolia*) and cinnamon (*Cinnamomum sp.*). The characterization of the EOs was performed by gas chromatography to verify the main compounds. A standardized strain of *Staphylococcus aureus*, (ATCC 25923) was used to observe the antibacterial activity. The bacterial death was evaluated by disc diffusion. After inoculation of the bacterial strains on Petri dishes, sterile filter paper discs with 6 mm diameter were placed on the medium impregnated with 1100 µg of each EO. After incubation for 24 h at 37±1°C, the inhibition halos around the discs were measured. As positive control, we used the antibiotic cefoxitin (CFO) at 30 µg. The discs were positioned on plates with Mueller-Hinton agar (MHA). In the statistical analysis, a completely randomized design was used, in a 2 × 3 factorial scheme, consisting of tea tree and eucalyptus essential oils, on the *S. aureus* strain, with 3 repetitions. The final result, determined by the arithmetic mean of the inhibition halos (mm), was subjected to analysis of variance (p<0.01) and SNK test (p<0.05), using PROC GLM. The melaleuca essential oil contained the predominant compounds terpinene-4-ol, with 48.51%, while the majority compound of the cinnamon EO was eugenol, with 65.42%. The effect of treatments on *S. aureus* bacteria showed that the antibiotic CFO (30 µg disc⁻¹) had the highest sensitivity, with a halo value of 21.45 ± 1.32 mm, followed by the cinnamon essential oil, with a halo value of 16.56 ± 2.84 mm, while in contrast, the melaleuca EO had a halo value of 11.80 ± 2.60 mm. We concluded that cinnamon and melaleuca essential oils present potential as sources of new antibacterial compounds for the control of bovine mastitis.

Keywords

Natural products, bacteria, cattle.