I-INTERNATIONAL MEETING OF ANIMAL SCIENCE IN SEMI-ARID REGIONS
Universidade Federal do Agreste de Pernambuco – UFAPE
July 03rd to 05th, 2024, Garanhuns-PE

Research line: Industry of Animal products and feed science

Antimicrobial activity of essential oils of oregano (*Origanum vulgare*), pink pepper *(Schinus terebinthifolia*), and melaleuca (*Melaleuca alternifólia*)

Maria Eduarda de Souza Pimentel*[1], Esterfani Pereira da Silva[1], Danielle Maria da Silva Bezerra[1], Luciana Felizardo Pereira Soares[1], Laura Leandro da Rocha[1], José Vitor Moreira Lima Filho[2],

[1]Universidade Federal Rural de Pernambuco, Departamento de Zootecnia, Recife/Pernambuco, Brasil.
[2]Universidade Federal Rural de Pernambuco, Departamento de Biologia, Recife/Pernambuco
*eduarda.spimente@ufrpe.br

In recent years, synthetic additives have been a worrying factor for the food industry. To overcome this impasse, essential oils emerge as an alternative, containing compounds and active principles that inhibit the development of microorganisms. Therefore, the objective was to evaluate the minimum inhibitory concentration (MIC) of the essential oils of Melaleuca *(Melaleuca alternifólia*), Oregano (*Origanum vulgare*), and Pink pepper (*Schinus terebinthifolia*) obtained commercially. The research was carried out at the Microbiology and Immunology Laboratory of the Biology Department of the Federal Rural University of Pernambuco. Bacterial isolates were used at a concentration of 3.5 x 107 CFU/mL (0.5 on the McFarland scale) of *Staphylococcus aureus* (ATCC 25923), and *Escherichia coli* (ATCC 25922) obtained commercially from the American Type Culture Collection. The bacterial concentration was adjusted to 3.5 x 107 Colony Forming Units/mL (CFU/mL) (0.5 on the McFarland scale). The essential oils were serially diluted in 14 different concentrations (10,000, 5,000, 2,500, 1,250, and 1,000 µg/mL to 500, 250, 125, 62.5; 31.25; 15.62; 7.81; 3 .90; 1.95 µg/mL) in dimethyl sulfoxide (DMSO). Then, 100 µl of these solutions were added to 96-well plates containing 100 µl of Mueller-Hinton broth and 5 µl of bacterial suspension. Each test was performed in triplicate and the plates were incubated in an oven at 37ºC for 24 hours. As an experimental control, wells with only Mueller-Hinton broth, wells with only essential oils, wells with Mueller-Hinton broth and bacterial suspension, and wells with the bacterial suspension with 100 µg/mL Gentamicin were used. After incubation, the plates were visually analyzed to determine the minimum inhibitory concentration (MIC), with its value being the lowest concentration of the natural product that visually inhibited microbial growth. Descriptive statistical analysis of the data obtained was carried out to assist in describing the observed phenomenon. Average MIC values were observed when applying the essential oils of oregano, pink pepper, and tea tree, 2500 µg/mL, 650 µg/mL, and 500 µg/mL for the *E. coli* strains, respectively, while the minimum inhibitory concentration of treatments is equivalent to 500 µg/mL for the *S. aureus* bacterial group. Regarding the antibacterial potential of pink pepper and tea tree, it was observed that the MIC for pink pepper essential oil was 625 µg/mL against *E. coli* and 500 µg/mL against *S. aureus*. Regarding tea tree essential oil, the MIC was consistent for both bacterial species, 500 µg/mL. Therefore, it is understood that there is antimicrobial effectiveness of these plant extracts against the bacteria *E. coli* and *S. aureus*, being a viable alternative to replacing chemical/synthetic additives traditionally used in human food.

Keywords: natural additive, food, antimicrobial action