

TITLE: ANTIBACTERIAL ACTIVITY AND SYNERGISM OF GERANIOL AND THYMOL AGAINST *STAPHYLOCOCCUS AUREUS* METHICILLIN-RESISTANT (MRSA) AND *ENTEROCOCCUS FAECALIS*

AUTHORS: FURLANETTO, A. ¹; ALVES, F.C.B. ¹; PEREIRA, A.F.M. ¹; ALBANO, M. ¹; ANDRADE, B.F.M.T. ¹; DO PRADO, A.C. ¹; FERNANDES JÚNIOR, A. ¹;

INSTITUTION: ¹DEPARTMENT OF MICROBIOLOGY AND IMMUNOLOGY. INSTITUTE OF BIOSCIENCES OF BOTUCATU- UNESP, UNIVERSIDADE ESTADUAL PAULISTA (RUBIÃO JUNIOR S/N- CEP: 18.610-307- BOTUCATU- SP

ABSTRACT:

The emergence of antibacterial resistant pathogens is a great challenge for researchers and biological professionals worldwide. This fact shows the constant need of development of new drugs to use in therapies of infection diseases caused by these bacteria. Some of the bacteria that stand out and have received attention from researchers are *Enterococcus sp.* and *Staphylococcus aureus* methicillin-resistant (MRSA). These bacterias are important nosocomial and foodborne pathogens. Essential oils (EO) and its major compounds, such as geraniol and thymol, are a potential antibacterial alternative, since their action has been proven in others studies. The objective of this study was to check the antibacterial potential of geraniol and thymol against MRSA ATCC 33591, *E. faecalis* ATCC 10100 and their respective clinicals isolated strains by the determination of minimum inhibitory concentration (MIC) using Resazurin Microtiter Assay (REMA) and the synergism between the compounds and drugs of therapeutic use in bacterial diseases by the methodology of *time kill curve*. The strains of MRSA showed more susceptibility to both compounds than *E. faecalis*, with MIC_{90%} from 21 µg/ml (thymol on MRSA) to 300 µg/ml (thymol on *E. faecalis*). There was no synergism between both tested compounds but there was a synergism between the drugs and the compounds, highlighting the 25% drugs and 25% tested compounds combinations, like the reduction of 83,1% in *E. faecalis* growth when treated with geraniol and cephalothin combination; and the reduction of 76% in MRSA growth when treated with thymol and oxacillin combination. It can be concluded that the results of this study are of great importance for the new alternatives search in treatments of infectious diseases. The natural products can potentiate the effects of traditional antibacterial drugs and then using a lower dose of them. However, more studies are needed for the knowledge of these essential oils action mechanisms.

Keywords: antibacterial activity, essential oils, nosocomial pathogens, antibiotics

