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Antibacterial activity of *Myrtus communis L.* and *Melaleuca leucadendron* var. *cajaputi* essential oils against antibiotic-resistant bacterial strains

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ABSTRACT

Background: Antimicrobial resistance (AMR) is a global threat to public health. There is a dire need for new antibiotics as AMR threatens our last-resort antibiotics efficacy.[1,2] Myrtle plants have been used in folk medicine for centuries. Essential oils from these plants demonstrated therapeutics effects. This study aims to examine the antibacterial activity of essential oils extracted from *Myrtus communis L* and *Melaleuca leucadendron* against clinically relevant bacterial pathogens.[3]

Methods: Bacterial growth curves and bactericidal assays were performed on antibiotic-sensitive *Staphylococcus aureus (SA)* and antibiotic low and high resistant Methicillin-resistant *Staphylococcus aureus* (MRSA) strains; sensitive and resistant *Klebsiella pneumoniae* strains (KPS and KPR). Minimum bactericidal concentration (MBC) was performed on 4 strains of colistin sensitive *E. coli* and 4 colistin resistant *E. coli* strains.

Results: Myrtle essential oils demonstrated a dose-dependent antibacterial activity against all tested strains and inhibited growth even after 24 hours. The tested oils dilutions ranged from 6.15 μl/ml up to 50 μl/ml and inhibited bacterial growth of both antibiotic sensitive and resistant strains of SA, MRSA (Figure 1), and *Klebsiella*. Further, the incubation of colistin sensitive and colistin-resistant *E. coli* strains with 50 μl/ml of Myrtle oil for one hour inhibited the growth of all tested strains. The viability of bacteria was tested by spotting on agar plates and further incubation overnight. The data suggest that Myrtle essential oils can effectively kill bacterial pathogens.

Conclusion: Essential oils from *Myrtus communis L.* and *Melaleuca leucadendron* var. *cajaputi* possess potent antibacterial activity against antibiotic sensitive and resistant bacterial pathogens. There is a potential for utilizing these antibacterial oils as topical treatment of wound infections.

Keywords: Antimicrobial resistance, Antibacterial activity, *Staphylococcus aureus; Klebsiella pneumonia;* Myrtle essential

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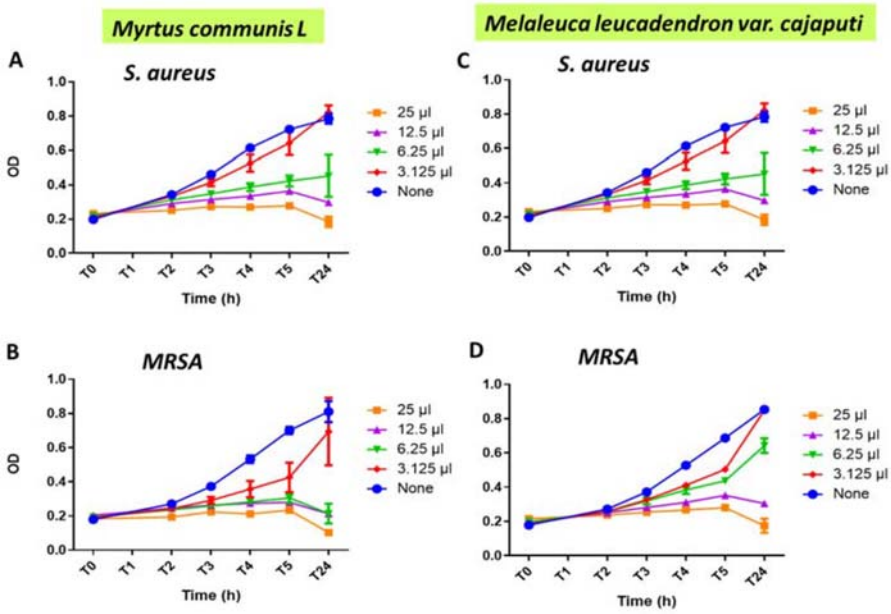

Figure 1. Antibacterial activity of Myrtle essential oils against sensitive (A,C) and resistant (B,D) strains of *Staphylococcus aureus*.

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