World Academy of Science, Engineering and Technology
International Journal of Medical and Health Sciences
Vol:14, No:12, 2020

Antibacterial Activity of Melaleuca Cajuputi Oil against Resistant Strain Bacteria

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Abstract : Infectious diseases are getting more difficult to treat due to the resistant strains of bacteria. Current generations of antibiotics are most likely ineffective against multi-drug resistant strains bacteria. Thus, there is an urgent need in search of natural antibiotics in particular from medicinal plants. One of the common medicinal plants, Melaleuca cajuputi, has been reported to possess antibacterial properties. The study was conducted to evaluate and justify the presence of antibacterial activity of Melaleuca cajuputi essential oil (EO) against the multi-drug resistant bacteria. Clinical isolates obtained from the teaching hospital were re-assessed to confirm the exact identity of the bacteria to be tested, namely methicillin-resistant staphylococcus aureus (MRSA), carbapenem-resistant enterobacteriaceae (CRE), and extended-spectrum beta-lactamases producer (ESBLs). A well diffusion method was done to observe the inhibition zones of the essential oil against the bacteria. Minimum inhibitory concentration (MIC) was determined using the microdilution method in 96-well flat microplate. The absorbance was measured using a microplate reader. Minimum bactericidal concentration (MBC) was performed using the agar medium method. The zones of inhibition produced by the EO against MRSA, CRE, and ESBL were comparable to that of generic antibiotics used, gentamicin and augmentin. The MIC and MBC results highlighted the antimicrobial efficacy of the EO. The outcome of this study indicated that the EO of Melaleuca cajuputi had antibacterial activity on the multi-drug resistant bacteria. This finding was eventually substantiated by electron microscopy work.

Keywords : melaleuca cajuputi, antibacterial, resistant bacteria, essential oil
Conference Title : ICCMI 2020 : International Conference on Clinical Microbiology and Immunity
Conference Location : London, United Kingdom
Conference Dates : December 10-11, 2020