ALCOHOL EFFECTS ON BIOFILM PRODUCTION OF *STAPHYLOCOCCUS AUREUS* AND *PSEUDOMONAS AERUGINOSA*

By

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AUTHOR'S DECLARATION

I hereby declare that this thesis is based on my original work. I also declare this thesis has not previously or concurrently submitted by any other degree students at UiTM or other institutions.

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ABSTRACT

Staphylococcus aureus (*S. aureus*) and *Pseudomonas aeruginosa* (*P. aeruginosa*) are known as the opportunistic pathogens which correspond to biofilm formation. Bacteria that develop as surface associated biofilms are difficult to treat with antimicrobials agents which then lead to lethal infection. Due to alcohol exposure lead to increasing biofilm formation which propose the circumstances of nosocomial infections in regard of alcoholic skin disinfectant are routinely applied in clinical setting. The aim of this study to determine the effect of alcohols against these two microorganisms. For this study, *S. aureus* and *P. aeruginosa* are tested with ethanol and isopropanol at different percentages (40%, 60%, 80%, and 95%) for 4 and 24 hours by quantifying biofilm formation. Adherence of biofilms were stained and determined with optical density. Ethanol and isopropanol treatment on sample increased the biofilm formation for certain percentages and duration. *S. aureus* showed an increased biofilm formation with ethanol at 4 and 24 hours. As in *P. aeruginosa* at 4 and 24 hours were displayed an increased biofilm formation were inducible by 60%, 80% and 95% isopropanol respectively. As for isopropanol treatment on *S. aureus* on 4 hours displayed decreased of biofilm formation as it indicates isopropanol works effectively on the organism. While for *S. aureus* at 24 hours shown an increased biofilm formation in 60%, 80% and 95% of isopropanol. For *P. aeruginosa* sample incubated for 4 hours were not inducible by ethanol as well as for 24 hours at 40%, 60%, and 80% respectively whereas within 24 hours, only 95% of ethanol, displayed an increased biofilm formation. Biofilm enhancement increased with increasing alcohol concentration for certain time. Hence, alcohols might be a poor disinfectant choice due to ineffectiveness to eliminate *S. aureus* and *P. aeruginosa* biofilm.

Keywords:*Staphylococcus aureus*, *Pseudomonas aeruginosa*, biofilm, alcohols