



**COMPARATIVE ANTIMICROBIAL ACTIVITIES OF ORGANIC ACID
EXTRACTS OF *Hibiscus sabdariffa* Linn. RED CALYXES ON BACTERIAS
NAMELY: *Staphylococcus aureus* AND *Escherichia coli***

By

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**Thesis Submitted in Partial Fulfillment for the Degree of Bachelor of Medical
Laboratory Technology (Hons), Faculty of Health Sciences; Universiti Teknologi
MARA**

2017

DECLARATION

“I hereby declare that this thesis is based on my original work and has not has been submitted previously or currently for any other degree at UiTM or any other institutions.”

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ACKNOWLEDGEMENT

First and foremost gratefulness to Allah S.W.T for all his Guidance, Mercy and Blessings that helped me to accomplish this final year research project in the acquired time.

My deepest appreciation was vowed to my supervisor, Mr. Zed Zakari for every guidance and supervision throughout this project. Continuous support and encouragement words from him, really do encouraged me to successfully complete this project research and I am honored to conduct this project under his supervision.

My heartfelt thanks to Medical Laboratory Technology (MLT) Department (Faculty of Health Sciences) for providing convenient facilities and funding for my research project. I specially thanked all lecturers and lab staffs of MLT Dept. for their assistance and continuous advice during lab work sessions.

I am grateful to Allah for blessing me with warm-hearted teammates. Their assistance, ideas and encouragements really aided me through the hard times in completing this project.

Special dedication was gratitude to my lovable parents, Mr. Mohamad Wan and Mrs. Norfidah Md. Yasin, as without their emotional and physical supports, I would not be able to have the strength to complete this project with flying colors.

Finally, my sincere thanks to all who either directly or indirectly involved throughout this period, as without them, it would be impossible for me to complete this thesis with success.

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ABSTRACT

COMPARATIVE ANTIMICROBIAL ACTIVITIES OF ORGANIC ACID EXTRACTS OF *Hibiscus sabdariffa* Linn. RED CALYXES ON BACTERIA NAMELY: *Staphylococcus aureus* AND *Escherichia coli*

Emergence of Multidrug Resistance organisms is an alarming situation. The intervention of novel antibiotic from medicinal plants that scientifically known as *Hibiscus sabdariffa* Linn (Roselle), might be the key for this problem. Roselle is a multi-purpose plant, in which the outer leaves (calyx) is reported by previous studies to have antimicrobial properties, subjected to its phytochemical contents and polarity of the biochemical compounds that is best extracted by using polar extraction solvent. The present study was conducted to compare the efficacy of organic acid (polar solvents) extracts of *H. sabdariffa* Linn. red calyxes as antimicrobial agent. Antimicrobial Sensitivity Testing (AST) and Antimicrobial Assay (MIC and MBC) was implied in attempt to achieve the objective of the study. Powder form of dry Roselle red calyx was soaked in three different vinegars (extraction solvent) with ratio of 1:2 for 24 hours extracted by using Maceration technique. The 50% concentration extracts were tested on *Staphylococcus aureus* and *Escherichia coli*. The antimicrobial efficacy were determined through technique of agar diffusion and broth microdilution method. Good inhibitory effect were shown against *S. aureus* compared to *E.coli* in all 3 tested organic acid extracts. There is probability that the extracts may be effective against Gram Positive bacteria. Out of three extracts, Distilled white vinegar-Roselle extracts shows most prominent antimicrobial effect with almost twice zone of inhibition yield by others. However, there is possibility that it is due to synergistic effect with the Distilled white vinegar since the vinegar itself revealed antimicrobial effect upon preliminary test against Gram positive organism. All extracts interpreted 'Clear' up to fifth well as tested against *S. aureus* while against *E.coli*, no visible growth seen in fifth well and sixth well for the ACV-R and DWV-R;RV-R, respectively. MIC value reported at 3.13% and 1.56% for 5th and 6th wells, respectively. MBC value displayed similar inhibitory patterns like MIC results with slight increase one concentration above on all tested extracts. Bactericidal effects (No growth on subculture medium) indicating MBC breakpoints. The study managed to prove the antimicrobial potencies of organic acid extracts of *H. sabdariffa* red calyx.

Keywords: *Hibiscus sabdariffa* Linn. , Antimicrobial activities, Organic acid