

**PHYTOCHEMICAL SCREENING AND ANTIMICROBIAL ACTIVITIES  
OF *Gynura procumbens* LEAVES EXTRACT AGAINST  
SELECTED BACTERIA**

**NUR SYAMIMIE IZZATI BINTI SAZUKI**

**Final Year Project Report Submitted in  
Partial Fulfillment of the Requirements For The  
Degree of Bachelor of Science (Hons.) Biology  
in The Faculty of Applied Sciences  
Universiti Teknologi MARA**

**JANUARY 2017**

## ACKNOWLEDGEMENTS

Bismillahirrahmanirrahim,

Alhamdulillah. Thanks to Allah SWT, whom with His willing giving me the opportunity to complete this Final Year Project which titled Phytochemical Screening and Antimicrobial activity of *Gynura procumbens* Leaves Extract against Selected Bacteria.

Firstly, I would like to express my deepest thanks to Ms. Nor Lailatul Wahidah binti Musa, my supervisor, for her excellent guidance and caring supervision throughout this final project. I also would like to thank lab assisstant that had given valuable information, suggestions and guidance in the compilation and preparation of this final project report.

Deepest thanks and appreciation to my parents, family and others for their cooperation, encouragement, and support for this project from the beginning till the end. Also thanks to all my friends and everyone, that has been contributed by supporting my work and helps me during the project progress till it is fully completed.

Last but not least, my thanks to UiTM Pahang for great commitment and cooperation during my Final Year Project.

(Nur Syamimie Izzati Binti Sazuki)

## TABLE OF CONTENTS

	<b>PAGES</b>
<b>ACKNOWLEDGEMENTS</b>	iii
<b>TABLE OF CONTENTS</b>	iv
<b>LIST OF TABLES</b>	vi
<b>LIST OF FIGURES</b>	vii
<b>LIST OF ABBREVIATIONS</b>	ix
<b>ABSTRACT</b>	x
<b>ABSTRAK</b>	xi
<b>CHAPTER 1: INTRODUCTION</b>	
1.1 Background of Study	1
1.2 Problem Statement	3
1.3 Significance of the Study	4
1.4 Objective of the Study	5
<b>CHAPTER 2: LITERATURE REVIEW</b>	
2.1 Introduction	6
2.2 <i>Gynura procumbens</i>	6
2.3 Phytochemical Screening	8
2.4 Phytochemical Constituents of Leaves <i>Gynura procumbens</i>	10 12
2.5 Solvent Extraction	13
2.6 Bacteria	14
2.6.1 Gram positive bacteria	16
2.6.2 Gram negative bacteria	17
2.7 Method Extraction	18
2.8 Dilution of Extraction	
<b>CHAPTER 3: METHODOLOGY</b>	
3.1 Materials	19
3.1.1 Raw materials	19
3.1.2 Chemicals	19
3.1.3 Apparatus	19
3.2 Methods	20
3.2.1 Collection of samples	20
3.2.2 Extraction of plant material	20
3.2.3 Media preparation	20
3.2.3.1 Broth media preparation	20

3.2.4	Preparation of standard inoculum	21
3.2.5	Phytochemical screening	21
3.2.5.1	Alkaloids	21
3.2.5.2	Flavonoids	21
3.2.5.3	Saponins	21
3.2.5.4	Tannins	22
3.2.5.5	Terpenoids	22
3.2.6	Antimicrobial Susceptibility Test	22
3.2.6.1	Disk diffusion method	22
3.2.6.2	Minimum Inhibition Concentration (MIC)	23
3.3	Statistical Analysis	24
<b>CHAPTER 4: RESULTS AND DISCUSSION</b>		
4.1	Percentage yield	25
4.2	Phytochemical Screening Test	26
4.3	Antimicrobial Activity of <i>G. procumbens</i>	31
4.4	Determination of the Minimum Inhibitory Concentration (MIC)	45
4.5	Statistical analysis	50
<b>CHAPTER 5: CONCLUSION AND RECOMMENDATIONS</b>		
5.1	Conclusion	52
5.2	Recommendation	53
<b>CITED REFERENCES</b>		55
<b>APPENDICES</b>		61
<b>CURRICULUM VITAE</b>		71

## ABSTRACT

### PHYTOCHEMICAL SCREENING AND ANTIMICROBIAL ACTIVITIES OF *Gynura procumbens* LEAVES EXTRACT AGAINST SELECTED BACTERIA

Medicinal plants are the local heritage with global important and the world is endowed with a rich wealth of medicinal plants. *Gynura procumbens* or Sambung Nyawa is a tropical plants species from the Asteraceae family. This study was conducted to determine the phytochemical constituents, the antimicrobial activity and minimal inhibition concentration (MIC) of extract against selective Gram positive and Gram negative bacteria. The bacteria involved are *Staphylococcus aureus*, *Bacillus subtilis*, *Klebsiella pneumoniae* and *Pseudomonas aeruginosa*. Gentamicin was used as positive control while methanol and hexane were used as negative control. Four concentrations of extract which were 50 mg/ml, 100 mg/ml, 200 mg/ml, and 400 mg/ml were prepared for antimicrobial activity while 6.25 mg/ml, 12.5 mg/ml, 25 mg/ml and 50 mg/ml concentrations were prepared to determine the MIC. Result showed that alkaloid, flavonoid, tannin and saponin were present in methanol extract while tannin, saponin and terpenoids were present in hexane extracts. Only methanol extract of *G. procumbens* leaves showed antimicrobial activities against *S. aureus*, *B. subtilis*, *K. pneumoniae* and *P. aeruginosa*. However, negative results were shown for antimicrobial activities with hexane extract against all bacteria tested at all concentrations. Highest antimicrobial activities were recorded against *S. aureus* at 400 mg/ml concentrations with 10.5 mm of inhibition zone. Minimum inhibition concentration of methanol crude extract against *S. aureus*, *B. subtilis*, *K. pneumoniae* and *P. aeruginosa* were at 12.5 g/mL, 25 g/mL, and 50 mg/mL, respectively. *G. procumbens* leaves contain alkaloid, flavonoid, saponin, tannin and terpenoid. Methanol extract only shows antimicrobial activity. *P. aeruginosa* was more resistant among other bacteria.