

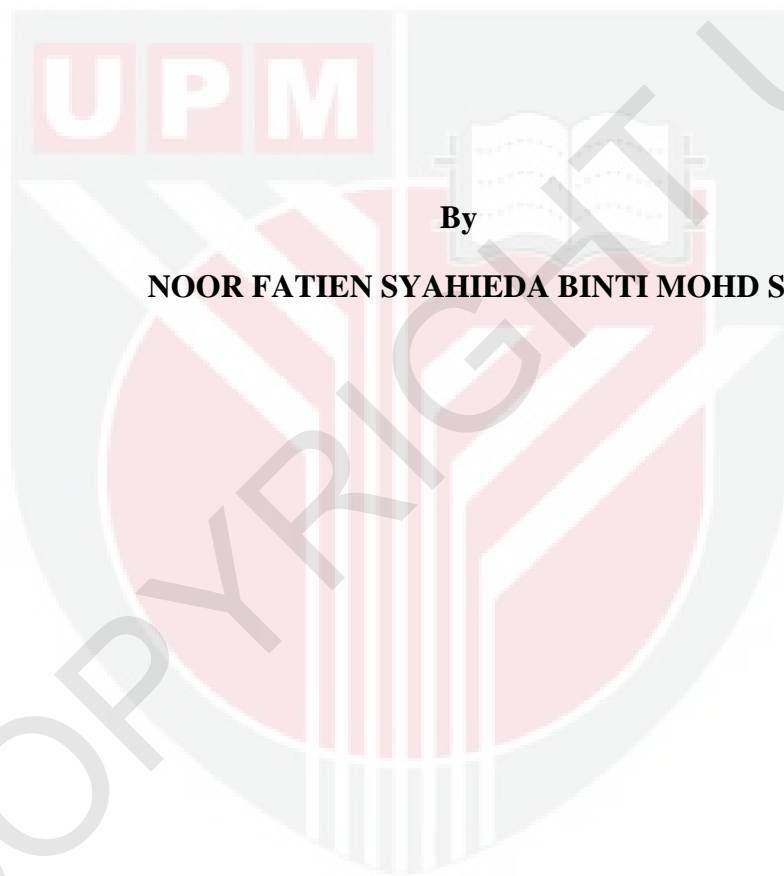


***PHYTOCHEMICAL OF MIKANIA MICRANTHA***

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**PHYTOCHEMICAL OF *MIKANIA MICRANTHA***



**By**

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**A Project Report in Partial Fulfilment of the Requirements for the Degree of  
Bachelor of Wood Science and Technology in the Faculty of Forestry**

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## ABSTRACT

*Mikania micrantha* known as “selaput tunggul”, is a medicinal plants that used as traditional medicine, belongs to family Asteraceacea. It is used to treat several diseases like external wound, cancer, skin itches, fever, respiratory deseases etc. It also shows antioxidant, antimicrobial and anti- stress activities. The present study was carried out to identify extractive values on different types of solvent and part of plant and to analyse the phytochemical and total phenolic content. The hot water extract on leaf was found has the highest yield with (27.64%) followed by cold water (24.11%), methanol (18.79), ethanol (17.08) and petroleum ether (4.11%) respectively. In stem the most extractive value was found in hot water (19.71%) followed by methanol (16.71), ethanol (14.81), cold water (12.71) and petroleum ether (0.87%) respectively. For total phenolic content, the highest concentration of phenols was measured in hot water extract, ( $325.28 \pm 2.28$ ) for stem and ( $335.5 \pm 2.37$ ) for leaves, followed by methanol extract for leaves ( $241.91 \pm 1.72$ ) and stem ( $196.63 \pm 1.41$ ) extract. Petroleum ether extracts contained the lowest TPC ( $26.87 \pm 0.24$ ) and ( $9.37 \pm 0.10$ ) for leaves and stem respectively. Phytochemical investigation of *M. micrantha* revealed the presence of various important secondary metabolites such as alkenes hydrocarbon, fatty acid, phenol and alcohol.

## ABSTRAK

*Mikania micrantha* yang dikenali sebagai "selaput tunggul", adalah tumbuhan ubat yang digunakan sebagai ubat tradisional, milik keluarga Asteraceacea. Ia digunakan untuk merawat beberapa penyakit seperti luka luar, kanser, gatal kulit, demam, penyakit pernafasan dan lain-lain. Ia juga menunjukkan aktiviti antioksidan, antimikrob dan anti-tekanan. Kajian ini dijalankan untuk mengenal pasti nilai-nilai ekstraktif dalam pelbagai jenis pelarut dan sebahagian tumbuhan dan untuk menganalisis kandungan phenolic phytochemical dan total. Ekstrak air panas pada daun didapati mempunyai hasil tertinggi dengan (27.64%) diikuti oleh air sejuk (24.11%), metanol (18.79), etanol (17.08) dan petroleum eter (4.11%) masing-masing. Di dalam stem nilai yang paling ekstraktif didapati dalam air panas (19.71%) diikuti oleh metanol (16.71), etanol (14.81), air sejuk (12.71) dan petroleum eter (0.87%) masing-masing. Untuk jumlah kandungan fenolik, kepekatan fenol tertinggi diukur dalam ekstrak air panas, ( $325.28 \pm 2.28$ ) untuk batang dan ( $335.5 \pm 2.37$ ) untuk daun, diikuti oleh ekstrak metanol untuk daun ( $241.91 \pm 1.72$ ) dan batang ( $196.63 \pm 1.41$ ) ekstrak. Ekstrak ether petroleum mengandungi TPC terendah ( $26.87 \pm 0.24$ ) dan ( $9.37 \pm 0.10$ ) untuk daun dan batang masing-masing. Penyelidikan fitokimia *M.micrantha* menunjukkan kehadiran pelbagai metabolit sekunder penting seperti alkenes hidrokarbon, asid lemak, fenol dan alkohol.

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Noor Fatien Syahieda Bt Mohd Sabri

## APPROVAL SHEET

I certify that this research project entitles “Phytochemical of *Mikania micrantha*” by “Noor Fatien Syahieda Binti Mohd Sabri” has been examined and approved as a partial fulfilment of the requirements for the degree of Bachelor of Wood Science and Technology in the Faculty of Forestry, University Putra Malaysia.

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## LIST OF ABBREVIATION

ANOVA	Analysis of variance
C	celcius
cm	centimetre
G	gram
GAE	Gallic acid equivalent
GC-MS	Gas Chromatography – Mass Spectrometry minute
m	meter
min	minute
<i>M.micrantha</i>	<i>Mikania micrantha</i>
%	percentage

# CHAPTER ONE

## INTRODUCTION

### 1.1 Research background

Phytochemical is a non- nutrient plant chemical compound or bioactive components that responsible for protecting the plant against microbial infection or infestation by pest (Doughari , 2012). It protects plants from disease such as damage from pest and environmental hazards such as pollution, stress, drought, UV exposure and pathogenic attack. It also contribute the colour, aroma, flavour to the plant (Saxena *et al.*, 2013). It has two categories which are primary and secondary constituents. Primary constituent include carbohydrate, lipids, protein and nucleic acid while secondary constituents include phenolic compound, alkaloids and terpenoids. Phytochemical also can be found in medicinal plant such as *Mikania micrantha*.

*Mikania Micrantha* belongs to Asteraceae family and its common name is “selaput tunggul”. It was introduced in India in the 1940s as ground cover in tea plantations. It is perennial fast- growing climber and is regarded as one of the world’s well-known invaders. Once established its kill nearby plant species by climbs up other plants and reducing light beneath its canopy (Huang *et al.*, 2000). It has invaded agricultural lands and plantation crops such as tea, oil palm, teak and rubber in moist forest zones of Asia, particularly South- East Asia. The figure below shows the *M. micrantha* as invader of oil palm plantation.



Figure 1: *Mikania micrantha* climbs up oil palm plantation. ( real site)

## 1.2 Justification

*Mikania micrantha* used as a traditional medicine, especially for the treatment of external wounds with existing of tannin and flavonoid can activate collagen synthesis and increase the number of granulation thus increase the wound healing rate. (Nicollier & Thompson, 1981; Nurdiana *et al.*, 2013). Nurdiana *et al.* (2013) also found that healing properties of *M. micrantha* have been proven through the application of the extract as an ointment on excision wound of diabetic rats

However, from the previous studies the findings regards to *M. micrantha* still not yet fully established. The phytochemicals of this species is not yet been identify for further understandings. Qualification and quantifications of phytochemical presences in *M. micrantha* rather than scanty. In this study, different type of extractions and solvent types are used to quantify and qualify of phytochemical in *M. micrantha* in different parts of plants (leaf and stem).

## 1.2 Objectives

The general objective of this project is identifying the phytochemical of *Mikania micrantha* and its potential use. While, the specific objectives of this project include to:

- I. Identify the extractive yield in *M. micrantha* on different types of solvent and part of plant.
- II. Analyse the phytochemical of *M. micrantha* using Gas Chromatography –Mass Spectrometry (GC-MS) and Total Phenolic Content (TPC).

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