ESSENTIAL OILS AND BIOACTIVITIES OF *Piper betle*

SOFEA SYAHIRA BT AHMAD SUFI

BACHELOR OF SCIENCE (Hons.) CHEMISTRY
FACULTY OF APPLIED SCIENCES
UNIVERSITI TEKNOLOGI MARA

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This Final Year Project Reported entitled **"Essential Oils and Bioactivities of *Piper betle*"** was submitted by Sofea Syahira Bt Ahmad Sufi, in partial fulfilment of the requirements for the Degree of Bachelor of Science (Hons.) Chemistry, in the Faculty of Applied Sciences, and was approved by

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Dr. Nor Akmalazura Bt Jani
Supervisor
B. Sc. (Hons.) Chemistry
Faculty of Applied Sciences
Universiti Teknologi MARA
72000 Kuala Pilah
Negeri Sembilan

_____

Ilyanie Bt Yaacob
Co-Supervisor
B. Sc. (Hons.) Chemistry
Faculty of Applied Sciences
Universiti Teknologi MARA
72000 Kuala Pilah
Negeri Sembilan

_____

Nurul Huda Abdul Halim
Project Coordinator
B. Sc. (Hons.) Chemistry
Faculty of Applied Sciences
Universiti Teknologi MARA
72000 Kuala Pilah
Negeri Sembilan

_____

Mazni Musa
Head of Programme
B. Sc. (Hons.) Chemistry
Faculty of Applied Sciences
Universiti Teknologi MARA
72000 Kuala Pilah
Negeri Sembilan

Date:_____

TABLE OF CONTENTS

ABSTRACT

ESSENTIAL OILS AND BIOACTIVITIES OF *Piper betle*

The chemical compositions as well as antioxidant and antibacterial activities of the leaves of *P. betle* collected from Negeri Sembilan, Selangor and Malacca have been studied. The essential oils were extracted by using hydrodistllilation method and the chemical compositions were analysed by using gas chromatography-mass spectrometry (GC-MS). The antioxidant effect was carried out using 2,2-diphenyl-1-picrylhydrazyl radical scavenging assay, while screening for antibacterial activity was performed using disc diffusion method. The essential oils from Negeri Sembilan, Selangor and Malacca yielded 32 (90.6%), 22 (95.8%) and 34 (86.2%) compounds, respectively. All essential oils were dominated by phenylpropanoids (41.5-85.2%) with eugenol being the most abundant compound (24.0-61.1%). The essential oil from Negeri Sembilan was also rich in 4-ally-1,2-diacetoxybenzene (13.9%), chavibetol acetate (12.6%) and germacrene D (9.5%), while the essential oil from Selangor was also contained chavicol (12.2%) and chavibetol acetate (5.9%) as the main compounds. Germacrene D (5.8%), β-caryophyllene (5.2%) and 4-ally-1,2-diacetoxybenzene (5.2%) were also identified in significant amount in the essential oil from Malacca. All investigated oils showed 2,2-diphenyl-1-picrylhydrazyl radical scavenging activity with the IC_{50} values 50.53 – 126.10 µg/mL. The highest radical scavenging activity was showed by the essential oil from Selangor (IC_{50} 50.53 µg/mL). The essential oil from Selangor also demonstrated the highest antibacterial activity toward *S. aureus* and *E. coli* with the inhibition zones 25.00 and 21.60 mm, respectively.