

**UNIVERSITI TEKNOLOGI MARA**

**ANTIOXIDANT AND ANTIBACTERIAL  
ACTIVITIES OF *M. MALABATHRICUM L.* IN  
AQUEOUS, CHLOROFORM AND METHANOL  
LEAF EXTRACTS USING VARIOUS ASSAYS.**

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“ With the name of ALLAH S.W.T, the Most Merciful. All gratifications are referred to ALLAH S.W.T.”

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## ABSTRACT

*Melastoma malabathricum* Lamk (*M. malabathricum* L.) leaves crude was tested for antioxidant activity antimicrobial activity which consists of aqueous extract (MMAE), chloroform extract (MMCE) and methanol extract (MMME). Total phenolic compounds in samples was investigated using total phenolics content (TPC) assay based on Gallic acid equivalence (GAE). The results showed all the extracts contain high phenolic contents (TPC) except for MMCE where MMAE contains  $3344.2 \pm 19.09$  mg/ 100g GAE; MMCE had  $92.46 \pm 7.25$ mg/ 100g GAE and MMME had  $3055.1 \pm 8.68$  mg/ 100g GAE. Antioxidant assay consists of DPPH assay, Xanthine/xanthine oxidase (X/XOD) superoxide scavenging assay and Tyrosinase inhibitory activity (%). The assays were run in order to get IC<sub>50</sub> value which showed the minimum concentration of sample needed in order to obtain 50 percent of activity in antioxidant assay. IC<sub>50</sub> of 273.842 µg/ml and 122.321 µg/ml for MMAE and MMME, respectively were recorded from DPPH assay. In (X/XOD) superoxide scavenging assay, MMAE and MMME give a significantly maximum scavenging activity which is 95.60 % and 98.50 %, respectively but only MMCE give the reading of IC<sub>50</sub> at 199.526 µg/ml whereas in Tyrosinase inhibitory activity (%), the IC<sub>50</sub> for MMCE and MMME are 183.021 µg/ml and 273.842 µg/ml. This showed that MMME have potent antioxidant activity at DPPH but perform less activity in thyrosinase inhibitory activity. Antimicrobial activity of *M. malabathricum* L. was done on various bacteria which are staphylococcus aures, escherichia coli, pseudomonas aeruginosa, candida albicans and microsporium canis. However, no activities were detected in all antimicrobial assays. The overall findings indicate that *M. malabathricum* L. crude extracts possess high antioxidant properties but no antimicrobial activity were observed at 5.0 µg/ µlit thus further investigates are needed to purify bioactive compounds in order to obtain more conclusive results.

# CHAPTER 1

## INTRODUCTION

Oxidation is a process of losing electrons by atom or molecule to an oxidizing agent. The process of oxidation in the human body damages cell membranes and other structures including cellular proteins, lipids and DNA (Halliwell *et al.*, 1992). This reaction will produce free radical which can cause damage to the cells.

Free radicals are any atoms with at least one unpaired electron in the outermost shell. The most common free radical is reactive oxygen species (ROS). ROS, such as superoxide anion ( $O_2^{\cdot-}$ ), hydroxyl radical ( $\cdot OH$ ), and peroxy radical ( $ROO\cdot$ ), are particularly reactive and are known to be a biological product in reducing molecular oxygen (Williams *et al.*, 2000). Damages mediated by free radicals result in the disruption of membrane fluidity, protein denaturation, lipid peroxidation, oxidative DNA and alteration of platelet functions, which have generally been considered to be linked with many chronic health problems such as cancers, inflammation, aging and atherosclerosis (Kinsella *et al.*, 1993).

Antioxidants are substances that can fight and destroy excess free radicals and repair oxidative damage in biomolecules (Vimala *et al.*, 2003). Ascorbic acids, tocopherols and  $\beta$  carotene are examples of antioxidants which act as strong reducing