

**UNIVERSITI TEKNOLOGI MARA**

**ANTIOXIDANT AND ANTIMICROBIAL  
ACTIVITY OF  
*Lignosus rhinocerus***

**NUR HAIDA BINTI MUHAMAD**

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## ABSTRACT

### ANTIOXIDANT AND ANTIMICROBIAL PROPERTIES OF

#### *Lignosus rhinocerus*

Aqueous extracts from sclerotium of *Lignosus rhinocerus* was screened for total phenolic content (TPC), antioxidant activity and antimicrobial activity. Analysis of TPC was done using the Folin–Ciocalteu method. Two methods for antioxidant assay were used which are 1, 1-diphenyl-2-picrylhydrazyl (DPPH) free radical-scavenging system and xanthine oxidase (XOD) superoxide scavenging system. Antimicrobial activity was screened using the microdilution test to measure minimum inhibitory concentration and minimum bactericidal concentration. Six types of microorganism strains were used which are *Staphylococcus aureus* ATCC25923 (A methicillin susceptible *S.aureus* isolate), *Staphylococcus aureus* ATCC33591 (A multi drug resistant *S.aureus* (MRSA) isolate), *Escherichia coli* ATCC10536, *Pseudomonas aeruginosa* ATCC27853, *Candida Albican* ATCC10231 and *Microsporium canis* ATCC36299. From the results obtained, the total phenolic compound (TPC) for this sample was  $2226.89 \pm 0.67$  mg/100g GAE. LRAE exhibited high scavenging effect (over 50%) at concentrations of 100µg/ml and 500µg/ml using xanthine oxidase (XOD) superoxide scavenging system. The LRAE only exhibited low scavenging effect (less than 10%) by using 1, 1-diphenyl-2-picrylhydrazyl (DPPH) free radical-scavenging method. Antimicrobial assay exerted negative results when no inhibitory activity can be detected at a concentration of 5µg/ml. The study shows that the samples have potential as a natural antioxidant source.

# CHAPTER 1

## INTRODUCTION

### 1.1 Introduction

Oxidation-reduction systems play so close and crucial in living organisms and life itself may be defined as a continuous oxidation-reduction reaction (Hewitt, 1936). Oxidation is necessary to many living organisms for the production of energy to fuel biological processes. However, reactive oxygen species such as hydroxyl, super oxide and peroxy radicals are produced in human tissue cells result in extensive oxidative damage which leads to age related degenerative conditions, cancer and wide range of other human diseases (Reaven and Witzum, 1996 and Aruoma, 1999).

Minimizing oxidative damage might be one of the most important approaches to the primary prevention of the ageing-associated diseases (Behera *et al.*, 2006). Antioxidants are substances that protect cells from the damage caused by unstable molecules known as free radicals. Free radical damage may lead to cancer. Antioxidants interact with and