



**EVALUATION OF TOTAL PHENOLIC CONTENT AND ANTIBACTERIAL
ACTIVITY OF *Aloe vera* EXTRACT TOWARDS FOOD-BORNE PATHOGENS**

By

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DECLARATION

I hereby declare that this thesis is my original work and has not been submitted previously or currently for any other degree at UiTM or any other institutions.

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ABSTRACT

EVALUATION OF TOTAL PHENOLIC CONTENT AND ANTIBACTERIAL ACTIVITY OF *Aloe vera* EXTRACT TOWARDS FOODBORNE PATHOGENS

Aloe vera is known to have a number of therapeutic uses such as antibacterial and anti-inflammatory, with properties of good antioxidant sources. Recently, the increasing amount of multidrug resistance is quite worrisome. In conjunction with that, this research was conducted to determine total phenolic content and antibacterial activity of *Aloe vera* extract against *Staphylococcus aureus*, *Bacillus cereus*, *Escherichia coli* and *Salmonella typhimurium*. By using 80% methanol extraction method, the total phenolic content was measured in absorbance by Spectrophotometer UV-Vis while method of disk diffusion assay, minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) were used to determine antimicrobial activity of *Aloe vera*. From this study, it was shown that methanol extract of *Aloe vera* has total phenolic content of 5.20 mg GAE/g. Meanwhile, the experiment of antimicrobial activity of *Aloe vera* extract had shown that both of gram positive bacteria, *Staphylococcus aureus* and *Bacillus cereus* were most sensitive towards *Aloe vera* extract, with MIC value measured at 62.5 mg/ml concentration of extract. Hence, it was concluded that *Aloe vera* possesses good phenolic content and effectively act as antimicrobial agent against several pathogens.

CHAPTER 1

INTRODUCTION

1.1 Background of study

In USA, herbal formulation is becoming more popular and increases in demands (Hsieh et al., 2008). Pharmaceutical is one of the examples of the use of medicinal plants that gave benefits to humans. Therefore Asia, specifically Malaysia, seems to be the most promising area for noticing new biologically-active substances from its flora (Hoareau et al., 1999; Perry et al., 1980; Murakami et al., 1999). In the last decade, numerous studies have been carried out in many countries to prove such efficiency in number of medicinal plants. Most of the studies are limited with crude extracts (Reddy et al., 2006; Ateflet al., 2003; Edro et al., 2002). Nowadays, the use of medicinal plants has become a great topic among biological scientific communities as the applications give huge benefits to human being. In the same time, medicine people are accepting the use of antimicrobial agents derived from plant extracts due to the ineffective traditional drugs. Furthermore, the limited effective life span of any antibiotics made scientists explore in depth on the natural sources.

The importance of reactive oxygen species (ROS) and free radicals are being discussed widely these days. ROS is continuously produced during normal physiologic events and they can easily initiate the peroxidation of membrane lipids, causing the accumulation of lipid peroxides. Overproduction of ROS will result in oxidative stress under pathological conditions. To minimize the ROS actions, there are a lot of antioxidants are introduced (Reynolds et al., 1999). Therefore, many efforts and intervention that has been taken to use medicinal plants as the source of antioxidant.

Aloe vera is a short succulent herb mimicking a cactus, with green dagger shaped fleshy, spiny and marginated leaves, which consist of clear viscous gel. *Aloe vera* has potent