



**EFFECTS OF ETHANOLIC EXTRACT OF *CENTELLA ASIATICA* LEAVES
ON EXPRESSION OF THIOREDOXIN REDUCTASE B IN
STAPHYLOCOCCUS AUREUS (ATCC 25923) IN VITRO**

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ABSTRACT

EFFECTS OF ETHANOLIC EXTRACT OF *CENTELLA ASIATICA* LEAVES ON EXPRESSION OF THIOREDOXIN REDUCTASE B IN *STAPHYLOCOCCUS AUREUS* (ATCC 25923) IN VITRO

Centella asiatica (*C. asiatica*) which grows in Southeast Asia countries possesses antimicrobial activities against *Staphylococcus aureus* (*S. aureus*). The prevalence of multidrug-resistance strains of *Staphylococcus aureus* (*MRSA*) demands new discovery for treatment of its infections. The objective of this study is to study the antimicrobial activity of ethanolic extract of *C. asiatica* leaves against *S. aureus* (ATCC 25923) by determining the minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) of ethanolic extract of *C. asiatica* against *S. aureus*, to determine the killing potential of ethanolic extract of *C. asiatica* against *S. aureus* in reference to hydrogen peroxide (H_2O_2) and to determine the expression of Thioredoxin reductase B (Trx B) in *S. aureus* in response to ethanolic extract of *C. asiatica* by SDS-PAGE. MIC of *C. asiatica* shown at 16 mg/ml while MBC is at 32 mg/ml. Liquid killing assay by *C. asiatica* of *S. aureus* at 30 minutes shown the percent of bacterial survival decreases compared with hydrogen peroxide with different 38% bacterial survival, while for *C. asiatica* extract with hydrogen peroxide have killing potential close with *C. asiatica* extract alone with different only 3% bacterial survival ($p > 0.05$). Thus *C. asiatica* has high potential to kill *S. aureus* compared with hydrogen peroxide. The effects of Trx B expression in *S. aureus* in response to *C. asiatica* have pipetting error when loading the sample into the wells. Thus, the expression of Trx B protein in *S. aureus* can't be compared in this study between treated *S. aureus* and untreated *S. aureus* with *C. asiatica* extract. Further study needs to be done in using HPLC, electroblotting and bioinformatics in identifying the amino acid sequences affected by treatment with extract.

CHAPTER 1

INTRODUCTION

1.1 Background of the study



Figure 1.1 *Centella asiatica*. L

For thousands of years, Plant has been used in traditional medicine all over the world. Malaysia has approximately 200 species of lower plants and 10,000 species of higher plants with her warm tropical climate and humidity throughout the years. With regards to the shift toward natural products in the pharmaceutical industry, research on herbs and plants particularly are as important as the research on conventional drugs (Azwanida, 2015) *Centella asiatica* (*C. asiatica*) or "Pegaga" is a traditional medicinal plant that is consumed in many Asiatic countries. According to Zainol (2003), reports from different places have shown that *C. asiatica* traditionally has been for wound healing, memory improvement treating, mental fatigue, antiallergic and anticancer. It grows in damp, moist and shady habitats, by producing stolons (runners S, are horizontal connections between organisms) that are characterized by long internodes and nodes, on which are borne reniform-cordate leaves and sessile flower in simple umbels (Mathur. *et al* 2015).