

CURRENT RESEARCH AND DEVELOPMENT IN BIOTECHNOLOGY ENGINEERING AT IIUM

VOLUME II

Editors:

Ibrahim Ali Noorbatcha
Hamzah Mohd. Salleh
Mohamed Elwathig Saeed Mirghani
Raha Ahmad Raus



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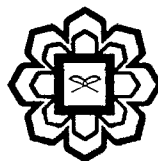
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CHAPTER 8

EXTRACTION OF ANTIBACTERIAL COMPOUNDS FROM PLANTS USING SONICATOR

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ABSTRACT

The increase in the number of pathogenic bacteria that is resistant to current antibiotics lead to the search of new antibacterial drugs. The antibacterial drugs sought in the current study are plant based since plants possess phytochemical constituents responsible for antibacterial activities. In this study, the leaves of six local plants which are *Spathiphyllum cannifolium* (Peace Lily), *Callistemon citrinus* (Brush Bottle), *Alpinia purpurata* (Red Ginger), *Ixora coccinea* (Jungle Geranium), *Mussaenda flava* (Dwarf Yellow Mussaenda) and *Cyrtostachys renda* ('Pinang Raja') were screened for their antibacterial activities. Ultrasonication using four different extracting solvents which are methanol, ethyl acetate, hexane and distilled water were employed for the extraction. In preliminary screening, the plant crude extracts were subjected to the screening against two strains of bacterial species, *Bacillus subtilis* and *Escherichia coli*, using standard protocol of Disc Diffusion Method. The antibacterial activity was assessed by the presence or absence of inhibition zones. Among these extracts tested, about 75% showed antibacterial activity against *Bacillus subtilis* and none of the extracts were active against *E. coli*. *S. cannifolium* (Peace Lily) extracted in ethyl acetate was found to have the highest antibacterial activity at 45°C and 30 minutes, producing maximum zone of inhibition (22.3 mm). This study suggested that *S. cannifolium* is highly potential in antibacterial activity which can be further analyzed for the development of new antibiotic exclusively for gram positive bacteria.

Keywords: Sonication, Antibacterial activity, *Spathiphyllum cannifolium*, Disc diffusion assay

INTRODUCTION

Infectious diseases are the primarily threat that account for death worldwide. In the last decades, the clinical efficacy of many synthetic antibiotics is being threatened by the emergence of a serious problem which can be defined as multi- drug resistant pathogens (Eldeen *et al.*, 2005). Multi- drug resistance in both human and plant pathogenic microorganisms has developed due to the incorrect usage of commercial antimicrobial drugs that have widely applied in the treatment of infectious diseases. Therefore scientists have tried to discover new antibacterial