UNIVERSITI TEKNOLOGI MARA

EFFICACY OF METHANOLIC EXTRACT FROM *CURCULIGO LATIFOLIA* DRYAND AGAINST PATHOGENIC MICROORGANISMS

MAI NORDHIYA BINTI MEOR NOR AZIAN

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Faculty of Phamacy

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TABLE OF CONTENTS

ABSTRACT

The objectives of this research were to study the antimicrobial activity of methanolic extract from *Curculigo latifolia* Dryand, to study the effect of extract's concentration and to determine the bactericidal or yeastocidal effect of the extract on selected microorganisms. Three extracts from the leaves, stems and roots of *Curculigo latifolia* Dryand have been produced by soaking in 95% methanol solvent (v/v). Screening for their antimicrobial activity was done by using disk diffusion method. During the screening test, each methanolic extract showed positive result against all of the eight tested bacteria. But for yeast, it showed positive result only against two tested yeast species. Negative result was showed against all of the tested fungi species. This was then followed by the Minimum Inhibitory Concentration (MIC) and the Minimum Bactericidal Concentration (MBC) tests, which were done in order to determine the effects of different concentration of the extract on the microorganisms. The MIC and MBC tests were done by using tube dilution technique. From the result, the MIC for the tested microorganisms ranged from 3.125 mg/mL to 12.5 mg/mL, whereas the MBC ranged from 6.25 mg/mL to 12.5 mg/mL. Finally, the bactericidal effect of the methanolic extract on the growth profile of *Bacillus subtilis* was investigated, at the concentrations of the half of the MIC value, at the MIC value, and at the two times of the MIC value. It was found that there was a significant inhibition in the growth of *Bacillus subtilis*, where the more concentrated the extract in the culture medium, the greater the extent of bacteriostatic and bactericidal activity of the extract, thus the lesser the growth of the bacteria and the lesser the ability for the bacteria to sustain its life. Overall results revealed that the methanolic extracts from Curculigo latifolia Dryand has significant efficacy against *Staphylococcus aureus, Bacillus subtilis, Escherichia coli, Enterobacter aerogenes, Pseudomonas aeruginosa, Erwinia sp., Klebsiella sp., Bacillus cereus, Candida albicans* and *Saccharomyces cerevisiae*. Thus, the extracts could be an important source of biologically active lead compounds useful for determining new antimicrobial agent.

CHAPTER 1

INTRODUCTION

1.1 Background of the study

Microorganisms are closely related to human lives, since they play important roles in biojism decomposition for production of energy, as well as in food and water pollution. They also can be the causes of various dangerous diseases. Due to this fact, the development of new antimicrobial agents seems to be very important, so as for treating various infectious diseases and as an incentive for controlling the microorganisms' ecology.

Natural products can be simply defined as products of natural origins, in which they include an entire organism, part of an organism, exudates, an extract of an organism or part of an organism, and pure compounds isolated from plants, animals, or microorganisms. However, most of the time, the term natural products refers to secondary metabolites. Secondary metabolites are a small molecules with molecular weight less than 2000 amu, which produced by an organism that are not strictly crucial for the survival of the organism (Sarker *et al.*, 2005).