

CURRENT RESEARCH AND DEVELOPMENT IN BIOTECHNOLOGY ENGINEERING AT IIUM

VOLUME III

Editors:

Md. Zahangir Alam
Ahmed Tariq Jameel
Azura Amid



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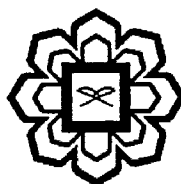
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**Department of Biotechnology Engineering
Faculty of Engineering
International Islamic University Malaysia**



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CHAPTER 16

ANTIMICROBIAL PROPERTY OF DATE SEED EXTRACT

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ABSTRACT

Twelve extracts from four solvents (ethanol, methanol, acetone and distilled water) and three varieties of date palm seeds (Deglet Nour, Biruni and Mixture) were tested in vitro for their antimicrobial activity against two Gram-positive (*Staphylococcus aureus* and *Bacillus subtilis*) and two Gram-negative (*Escherichia coli*, *Pseudomonas aeruginosa*) bacteria species to establish whether or not they have antimicrobial activity. The central composite design was used to investigate the effects of three independent variables (extraction temperature, extraction time and agitation speed) on the dependent variable (inhibition zone). All the twelve extracts of date palm seeds inhibited all the test microorganisms with minimum inhibitory concentration ranging from 10 to 42mg/ml and with minimum bactericidal concentration ranging from 21 to 167mg/ml. Extraction temperature, agitation, and extraction time significantly affected total antimicrobial contents extracted from date seeds.

INTRODUCTION

Phoenix dactylifera, commonly known as the date palm (Fig. 1), is a palm in the genus *Phoenix*, extensively cultivated for its edible sweet fruit. Due to its long history of cultivation for fruit, its exact native distribution is unknown, but probably originated somewhere in the desert oases of northern Africa, and perhaps also southwest Asia (Jassim, 1995).

Dates of date palm tree (*Phoenix dactylifera* L.) are popular among the population of the Middle Eastern countries. The fruit is composed of a fleshy pericarp and seed which constitutes between 10% and 15% of date fruit weight (It is a medium-sized tree, 15–25 m tall, often clumped with several trunks from a single root system, but often growing singly as well. The leaves are pinnate, 3–5 m long, with spines on the petiole and about 150 leaflets; the leaflets are 30 cm long and 2 cm broad. The full span of the crown ranges from 6–10 meters (Hamada *et al* , 2002).

Date is dioecious, having separate male and female plants. They can be easily grown from seed, but only 50% of seedlings will be female and hence fruit bearing, and