

CURRENT RESEARCH AND DEVELOPMENT IN BIOTECHNOLOGY ENGINEERING AT IIUM

VOLUME III

Editors:

Md. Zahangir Alam
Ahmed Tariq Jameel
Azura Amid



IIUM PRESS

INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA

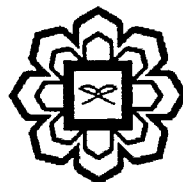
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**Department of Biotechnology Engineering
Faculty of Engineering
International Islamic University Malaysia**



IIUM Press

Published by:
IIUM Press
International Islamic University Malaysia

First Edition, 2011
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Perpustakaan Negara Malaysia

Cataloguing-in-Publication Data

Md. Zahangir Alam, Ahmed Tariq Jameel & Azura Amid: Current Research and Development in Biotechnology Engineering at IIUM Volume III

ISBN: 978-967-418-144-4

Member of Majlis Penerbitan Ilmiah Malaysia – MAPIM
(Malaysian Scholarly Publishing Council)

Printed by :
IIUM PRINTING SDN. BHD.
No. 1, Jalan Industri Batu Caves 1/3
Taman Perindustrian Batu Caves
Batu Caves Centre Point
68100 Batu Caves
Selangor Darul Ehsan

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CHAPTER 3

OPTIMIZATION OF THE EXTRACTION PROCESS PARAMETER TO OBTAIN HIGHEST ANTI-CANCER ACTIVITY FROM KENAF SEEDS

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ABSTRACT

Kenaf (*Hibiscus cannabinus*) is composed of various active components including tannins, polyphenolics, alkaloids, essential oils and steroids. In this study, kenaf seeds oil was used as a material in observing the anticancer activity on MCF-7 cancer cell line and finding the optimum parameter to extract the oil that give the highest anticancer activity. Kenaf variety Khon kaen seeds were extracted using Supercritical Fluid Extractor (SFE). The extraction was done at the different level of temperature and pressure which range from 40 to 80°C and 200 to 600 bars respectively. Among these two parameters, temperature shows the highest impact on the percentage viability of MCF-7 breast cancer cell line. All the oils were cytotoxic towards MCF-7 breast cancer cell line in dose dependent manner as detected using the SRB assay. Kenaf seeds oil extracted from SFE at temperature of 40°C and pressure of 400 bars was the most cytotoxic towards MCF-7 breast cancer cell line with the IC₅₀ value of 321.43 µg/ml.

Key words: anticancer, Kenaf seeds oil, MCF-7 cell line, Supercritical Fluid Extractor (SFE)

INTRODUCTION

Kenaf (*Hibiscus cannabinus*) from the family of Malvaceae is a valuable fibre plant native to India and Africa. Kenaf is composed of various active components including tannins, polyphenolics, alkaloids, essential oils and steroids. Since many years ago, kenaf has been used as cordage (any type of rope or string made by twisting fibers together) crop and secondarily as a livestock feed (Charles, Webber, & Venita, 2002). Charles (2002) reported that kenaf plant is composed of multiple useful components such as stalks, leaves, and seeds. Each of these components contains various usable portions, for examples, fibers and fiber strands, proteins, oils and allelopathic chemicals.