ANTICANCER ACTIVITY OF FRUIT AND LEAF EXTRACTS OF *Pandanus odoratissimus* ON HUMAN BREAST CANCER (MCF-7) CELL LINE

RODHIYAH BINTI YAHYA

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Lihat Sebelah

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By

Rodhiyah Binti Yahya

Research report submitted in partial fulfillment of

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DECLARATION AND VERIFICATION REPORT

FINAL YEAR RESEARCH PROJECT

It is hereby declared and verified that this research report entitled Anticancer Activity of Fruit and Leaf Extracts of *Pandanus odoratissimus* on Human Breast Cancer (MCF-7) Cell Line by **Rodhiyah binti Yahya**, matric number of **UK 25389** have been examined and all errors identified have been corrected. This report submitted to the School of Marine Science and Environment as partial fulfillment towards obtaining the **Degree of Marine Biology**, School of Marine Science and Environment, Universiti Malaysia Terengganu.

Verified by:

.....

Supervisor

Name: Dr. Yosie Andriani HS

Official Stamp: DR. YOSIE ANDRIANI HS
Pensyarah
Institut Bioteknologi Marin
Universiti Malaysia Terengganu
21030 Kuala Terengganu

Date: 15/06/2014

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LIST OF ABBREVIATIONS

°C	-	degree Celsius
µg	-	microgram
Abs	-	absorbance
BCS	-	basic cancer surgery
CO_2	-	carbon dioxide
DMSO	-	dimethyl sulfoxide
DNA	-	deoxyribonucleic acid
DPPH	-	2, 2-diphenyl-1-picrylhydrazyl
EDTA	-	ethylenediaminetetracetic
ELISA	-	enzyme linked immunosorbent assay
g	-	gram
HER2	-	human epidermal growth factor
IC_{50}	-	50% inhibition concentration
IMB	-	Institute Marine Biology
M	-	molarity
MCF-7	-	breast cancer cells line
mg	-	milligram
ml	-	milliliter
NCI	-	National Cancer Institute
nm	-	nanometer
PBS	-	phosphate buffered saline
ROS	-	reactive oxygen species
RPMI	-	Rosewell Park Memorial Institute

TLC	-	Thin layer chromatography
U	-	unit
UV	-	ultraviolet
λ	-	wavelength

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ABSTRACT

Natural products play an important role in production of new drugs, new drug leads and new chemical entities. *Pandanus odoratissimus* (Pandanaceae) is one of the most popular herbs and locally grows in Malaysia, and has been used traditionally to Ayurvedic medicine cure certain diseases. The present study is aimed to find out antioxidant and anticancer activity of *P. odoratissimus* against human breast cancer cell lines (MCF-7). Antioxidant activity has been measured by using 2, 2-diphenyl-1-picrylhydrazyl (DPPH) free radical scavenging activity and core showed highest antioxidant value among the other extracts. The effects of plant's parts on MCF-7 cell lines were determined using [3-(4, 5-dimethylthiazolyl)-2, 5-diphenyl-tetrazolium bromide], MTT assay. Thin layer chromatography (TLC) has been used to assay the antioxidant compound present in most active antioxidant activity of keys and core of ethyl acetate extracts. Antioxidant activities in extracts of *P. odoratissimus* found increase significantly with the increase of concentration of samples. Our results showed declination of cell viability occurring in sample treated cancer cell after 72 hours of treatment. Its killing efficiency in cancer cells are considered less because the IC_{50} value is 88.00 μg/ml which suggest the extracts are mildly toxic and no potential to make anticancer compound.

AKTIVITI ANTI-KANSER DARIPADA EKSTRAK BUAH DAN DAUN *Pandanus odoratissimus* KE ATAS MCF-7

ABSTRAK

Produk semula jadi masih kekal sebagai sumber penting ubat-ubatan baru, petunjuk ubat baru dan entiti kimia baru. *Pandanus odoratissimus* (Pandanaceae) adalah salah satu herba yang paling popular dan tumbuh secara semula jadi di Malaysia, dan telah digunakan secara tradisional untuk perubatan Ayurveda untuk menyembuhkan penyakit tertentu. Kajian ini bertujuan untuk mengetahui aktiviti antioksidan dan antikanser *P. odoratissimus* terhadap sel kanser payudara manusia (MCF -7). Aktiviti antioksidan telah diukur dengan menggunakan 2,2-difenil-1-picrylhydrazyl (DPPH) aktiviti memerangkap radikal bebas dan umbuk buah *P. odoratissimus* menunjukkan nilai antioksidan tertinggi antara ekstrak yang lain. Kesan ekstrak bahagian tumbuhan pada MCF-7 sel telah ditentukan menggunakan [3-(4,5-dimethylthiazolyl) 2, 5 Diphenyl-tetrazolium bromide], MTT assay. Kromatografi lapisan nipis (TLC) telah digunakan untuk assay sebatian antioksidan di dalam aktiviti antioksidan yang paling aktif untuk ekstrak 'keys' dan umbuk etil asetat bagi *P. odoratissimus*. Aktiviti antioksidan dalam ekstrak *P. odoratissimus* didapati meningkat selari dengan peningkatan kepekatan sampel. Keputusan kami menunjukkan kemerosotan daya maju sel yang berlaku dalam sampel dirawat sel kanser selepas 72 jam rawatan. Kecekapan membunuh sel-sel kanser dianggap kurang kerana nilai IC_{50} adalah 88.00 μg/ml yang mencadangkan ekstrak adalah sedikit toksik dan tiada potensi untuk membuat sebatian antikanser.