

**SCREENING OF POTENTIAL ENZYME PRODUCERS FROM
MICROORGANISMS ISOLATED FROM SOIL AND COMPOST MATERIAL
(AGRICULTURAL SOLID WASTE)**



**INSTITUTE OF RESEARCH, DEVELOPMENT AND COMMERCIALIZATION
(IRDC)
UNIVERSITI TEKNOLOGI MARA
40450 SHAH ALAM, SELANGOR**

BY :

**WAN RAZARINAH BT WAN ABDUL RAZAK
ERNIE EILEEN RIZLAN ROSS
RAFIDAH RASOL**

NOVEMBER 2006



Surat Kami : 600-IRDC/ST 5/3/920
Tarikh : 17 Januari 2005

Dekan
Fakulti Sains Gunaan
Universiti Teknologi MARA
40450 Shah Alam
SELANGOR

Tuan/ Puan

PERLANTIKAN BAGI MENJALANKAN PENYELIDIKAN

Merujuk kepada perkara di atas, bersama-sama ini dimajukan salinan surat kelulusan menjalankan penyelidikan serta ringkasan kos perbelanjaan bagi penyelidikan yang dijangka oleh pensyarah dari Fakulti Sains Gunaan:

Tajuk Projek : Screening of Potential Enzyme Produces From
Microorganisms Isolated from Oil and Compost Material

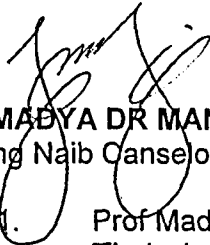
Ketua Projek : Puan Wan Razarinah Wan Abdul Razak

Kos Yang diluluskan : RM 17,000.00

Jenis Geran : Geran Dalaman

Sekian, terima kasih.

Yang benar



PROF MADYA DR MANSUR AHMAD
Penolong Naib Canselor (Penyelidikan)

- s.k:
1. Prof Madya Dr Samirah Abdul Rahman
Timbalan Dekan (Kualiti dan Penyelidikan)
Fakulti Sains Gunaan
 2. Puan Wan Razarinah Wan Abdul Razak
Ketua Projek
Fakulti Sains Gunaan
 3. Encik Mohd Halil Marsuki
Penolong Akauntan
Unit Kewangan Zon 17

ELIDIKAN, PEMBANGUNAN DAN PENGKOMERSILAN LANDASAN KEWIBAWAAN DAN KECEMERLANGAN

Canselor (Penyelidikan) : 03-55442094/5
ikan (Sains Sosial dan Pengurusan) : 03-55442097
ikan (Sains dan Teknologi) : 03-55442091
C : 03-55442760
gan (Kewangan) : 03-55442090

Ketua Perundingan : 03-55442100
Ketua Pengkomersilan : 03-55442750
Ketua Harta Intelek : 03-55442753
Penolong Pendaftar : 03-55442092
Pegawai Sains : 03-55442098

Pegawai Eksekutif : 03-55442057
Pejabat Am : 03-55442093/2101
Fax : 03-55442096
Unit Kewangan Zon 17 : 03-55443440
Penolong Akauntan : 03-55442099



TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENT	i
TABLE OF CONTENTS	ii
LIST OF FIGURES	vi
LIST OF TABLES	ix
ABSTRACT	x
CHAPTER 1 INTRODUCTION	
1.0 Prologue	1
1.1 Problem Statement	1
1.2 Objectives	2
1.3 Significance of Study	3
1.4 Scope	3
1.5 Literature Study	4
1.5.1 General	4
1.5.2 Soil Fungi	6
1.5.3 Cellulase	6
1.5.4 Protease	8

CHAPTER 2 METHODOLOGY

2.0	Prologue	10
2.1	Sample Collection	10
2.2	Sample Preparation	11
2.3	Isolation of Fungi	12
2.4	Screening for Cellulase Producers	12
2.5	Screening for Protease Producers	14
2.6	Fungi Characterization	14

CHAPTER 3 RESULTS

3.1	Preamble	15
3.2	Fungi isolation	15
3.3	Fungi isolation from soil samples	15
3.4	Fungi isolation from agricultural solid waste	23
3.5	Screening of cellulase enzyme producers from fungi isolated from soil samples	29
3.5.1	Screening using cellulose agar	29
3.5.2	Screening using CMC agar	30
3.5.3	Screening using cellulose enrichment medium	31
3.5.4	Screening using peptone water based medium added with cellulose	32
3.6	Screening of protease enzyme producers from fungi isolated from soil samples	33

Abstract

This study was aimed at isolating and screening of fungi from various soil and agricultural solid waste for potentiality in producing the industrially important cellulase and protease enzymes. As many as fourteen different fungi strains were successfully isolated from ten samples of soil namely backyard soil, palm oil soil, chicken farm soil, laterite soil, paddy field soil, cocoa farm soil, forest soil, riverbank soil, compost soil and peat soil using the pour plate method on Potato Dextrose Agar (PDA). Eight out of fourteen isolated fungal isolates showed the ability of producing protease enzyme as demonstrated by the production of clearing zone on Skim Milk Agar (SMA). Four of them showed morphological characteristics similar to those of *Aspergillus* spp, while three other strains showed similar characteristics to fungi of the Order Mucorales. Meanwhile, one strain showed characteristics similar to fungi under the Class Trichomycetes.

On the other hand, as many as eighteen different fungal isolates were successfully isolated from eight different agricultural solid waste samples namely dried palm seeds, squeezed palm seeds, palm bunch, coconut dregs, coconut husks, sugar cane dregs, corn bunch and paddy hays . Out of the eighteen isolated fungi, twelve of them were found to be able to produce protease enzymes as demonstrated by the production of clearing zone on Skim Milk Agar (SMA). Five of the potential isolates resemble the characteristics of *Aspergillus* spp., while two of them have similar characteristics to *Penicillium* spp. Two have the characteristics of *Microsporium* spp. and one of them shows similar characteristics to *Mucor* spp.