

**CURRENT RESEARCH
AND DEVELOPMENT IN
BIOTECHNOLOGY
ENGINEERING
AT IIUM**

VOLUME I

Editors:

Suleyman Aremu Muyibi
Mohammed Saedi Jami
Zaki Zainudin



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(VOLUME I)

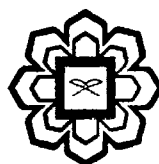
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CONTENTS

PREFACE		v
CHAPTER 1	SELECTION OF POTENTIAL FUNGAL STRAINS FOR THE PRODUCTION OF GLUCOAMYLASE USING NON-FOOD CASSAVA <i>Md Zahangir Alam, Hamzah Mohd Salleh, Juwairiyah Abd Karim, and Altyu Salihu</i>	1 (4157/20570)
CHAPTER 2	WATER QUALITY MODELING TO ASSESS THE IMPACTS OF PALM OIL MILL EFFLUENT (POME) IN SG. KALUMPANG BASIN <i>Zaki Zamudin</i>	7 (6601/20573)
CHAPTER 3	WATER QUALITY CHARACTERIZATION STUDIES ON SPRING WATER FOR USE IN PONDS FOR KELAH FISH BREEDING IN KELAH SANCTUARY <i>Suleyman Aremu Muyibi, Siti Hatyah Binti Mortan, and Mohamed Ismail Abd Karim</i>	13 (4164/20576)
CHAPTER 4	THE SOLID WASTE MANAGEMENT SYSTEM ISSUES ON POLLUTION AND WASTE DISPOSAL PROBLEMS <i>Nassereldeem Kabbashi, Najla Shuhud, and Mohammed Saedi Jamil</i>	19 (4286/20578)
CHAPTER 5	SETTLING COLUMN ANALYSIS FOR WATER TURBIDITY REMOVAL USING CHITOSAN <i>Nassereldeem Ahmed Kabbashi and Muhammad Fazil B Anotar</i>	26 (4286/20584)
CHAPTER 6	PROCESS DEVELOPMENT OF REMOVING LOW TURBIDITY WATER USING CHITOSAN AS A BIOCOAGULANT <i>Nassereldeem Ahmed Kabbashi and Muhammad Fazil B Anotar</i>	32 (4286/20588)
CHAPTER 7	OPTIMIZATION OF PROCESS CONDITIONS FOR GLUCOAMYLASE PRODUCTION USING NON-FOOD CASSAVA <i>Md. Zahangir Alam, Hamzah Mohd Salleh, Radhiah Ariffin, and Noor Mohammad</i>	38 (4157/20590)
CHAPTER 8	DEVELOPMENT OF RAPID ENZYMATIC PROCESS FOR ACID OIL PRODUCTION FROM SLUDGE PALM OIL <i>Md Zahangir Alam, Hamzah Mohd Salleh, and Noraimi Mohd Yusof</i>	44 (4157/20596)
CHAPTER 9	OPTIMISATION OF CHROMATOGRAPHY CONDITION FOR BIOPHENOLS SEPARATION FROM OIL PALM FRUIT FIBER <i>Parveen Jamal, Shahrul Yahaya, Md Zahangir Alam, and Azlin Azmi</i>	51 (2937/20598)
CHAPTER 10	MORINGA SEED OIL EXTRACTION AND CAKE PROCESSING FROM BENCH TO COMMERCIAL PRODUCTION OF ALTERNATIVE WATER TREATMENT CHEMICALS FOR DEVELOPING COUNTRIES <i>Suleyman A Muyibi and Idris M Bugaje</i>	60 (4146/20603)
CHAPTER 11	INVESTIGATION OF ANTIBACTERIAL ACTIVITY OF MORINGA OLEIFERA SEEDS FOR APPLICATION IN WATER TREATMENT <i>Suleyman A Muyibi and Farhana Aina Bt Ahmad Nazir</i>	66 (4164/20605)
CHAPTER 12	SCREENING OF LIGNOCELLULOSIC MATERIALS FOR THE PRODUCTION OF FERMENTABLE SUGAR <i>Md. Zahangir Alam, Abdullah-Al-Mamun, Hikmah Mohd Noor, and Noor Mohammad</i>	72 (4151/20606)
CHAPTER 13	LOCAL SOURCING FOR RENEWABLE AND SUSTAINABLE REPLACEMENT FOR WATER AND WASTEWATER TREATMENT CHEMICALS: ACTIVATED CARBON FROM AGRO-WASTES <i>Suleyman Aremu Muyibi Mohd Ismail Abdulkarim, Md Zahangir Alam, Emad S M Ameen, and Nassereledeen A Kabbashi</i>	77 (4164/20610)
CHAPTER 14	EVALUATION OF THE PERFORMANCE OF WATER TREATMENT SYSTEM FOR KELAH BREEDING IN FISH PONDS <i>Suleyman Aremu Muyibi, Siti Sara Binti Ghazali, and Mohamed Ismail Abd Karim</i>	85 (4164/20612)

CHAPTER 15	DESIGN OF TERTIARY TREATMENT SYSTEM FOR EFFLUENT FROM STP AT IUM FOR HORTICULTURAL USES <i>Suleyman A Muyibi and Tamrin Tajari</i>	91 (4164/2063)
CHAPTER 16	COMPARATIVE STUDIES OF MORINGA OLEIFERA AND ALUMINIUM SULPHATE AS COAGULANTS IN TURBIDITY REMOVAL FROM SURFACE WATER <i>Suleyman A. Muyibi, Eman N Ali, Md Zahangir Alam, and Hamzah M Salleh</i>	96 (4164/20618)
CHAPTER 17	AN EXPERT SYSTEM FOR DESIGN OF WATER TREATMENT PLANT <i>Nassereldeen Kabbashi, Anwar Bin Mohamad, and Suleyman A Muyibi</i>	101 (4286/20619)
CHAPTER 18	ISOLATION AND SCREENING OF POTENTIAL MICROORGANISM FOR BIOREMEDIATION OF HYDROCARBON CONTAMINATED SITES <i>Parveen Jamal, Md Zahangir Alam, and Nur Aneem Fadza</i>	106 (2937/20625)
CHAPTER 19	SLUDGE PALM OIL AS A POTENTIAL SOURCE FOR EMULSIFIER PRODUCING STRAIN <i>Parveen Jamal, Md Zahangir Alama, and Nur Fathiah Abd Sama</i>	113 (2937/20631)
CHAPTER 20	MICROBIAL FERMENTATION FOR PRODUCING SURFACE ACTIVE AGENT BY USING PALM OIL MILL EFFLUENT ISOLATE <i>Parveen Jamal, Md Zahangir Alam, Nur Aneem Fadza, and Wan Mohd Fazli Wan Nawawi</i>	119 (2937/20632)
CHAPTER 21	A BATCH PROCESS PRODUCTION OF COMPOST AND KINETICS ORDER OF REACTION STUDY BY ISOLATED FUNGAL STRAINS <i>Nassereldeen A Kabbashi, Optakun Suraj, and Md Zahangir Alam</i>	126 (4286/20635)
CHAPTER 22	ANALYSIS OF ELECTROFORCED SEDIMENTATION OF ZINC OXIDE <i>Mohammed S Jami, Masashi Iwata, Ma an Alkhatib, and Mujeli Mustapha</i>	137 (5545/20639)
CHAPTER 23	PRODUCTION OF BIODIESEL BY ACID-BASE CATALYZED TRANSESTERIFICATION OF WASTE COOKING OIL IN A BATCH REACTOR <i>Md Zahangir Alam, Parveen Jamal and Nor Rashid Bin Mohamad</i>	143 (4157/20641)
CHAPTER 24	FRACTIONATION, IDENTIFICATION AND QUANTIFICATION OF BIOPHENOLS FROM OIL PALM FRUIT FIBER <i>Parveen Jamal, Shahrul Yahaya, Md Zahangir Alam, and Azlin Azmi</i>	150 (2937/20644)
CHAPTER 25	CELLULASE PRODUCTION FROM RICE STRAW AND CORN COB BY SOLID STATE BIOCONVERSION <i>Md Zahangir Alam, Mazlinor Mohd Awal, and Aliyu Salihu</i>	158 (4157/20646)
CHAPTER 26	NATURAL DISINFECTANTS FOR WATER TREATMENT <i>Mohamed E S Mirghani, I A Ahmed, S A Muyibi, J I Daoud and M A Mikail</i>	164 (4971/20649)
CHAPTER 27	REMOVAL OF WATER TURBIDITY BY USING FABA BEANS <i>Mohamed E S Mirghani, Nasereldin A Kabbashi, and Fasehah Abdul Kadir</i>	173 (20653)
CHAPTER 28	WASTE TO WEALTH: DATE SEED PITS <i>Mohamed E S Mirghani, M A Mikail, I A. Ahmed, M I Abdul Karim and J I Daoud</i>	180 (4971/20656)
CHAPTER 29	EFFECT OF HYDROGEN PEROXIDE ON SETTLEABILITY AND FILTERABILITY OF SLUDGE FROM DRINKING WATER TREATMENT PLANT <i>Mohammed Saedi Jami, Suleyman Aremu Muyibi, and Mohd Shahril Bin Kamaruddin</i>	188 (5545/20659)
CHAPTER 30	ENHANCING THE DEWATERABILITY OF SLUDGE FROM WASTEWATER TREATMENT PLANT <i>Mohammed Saedi Jami, Suleyman Aremu Muyibi, and Nur Salihah Embong</i>	194 (5545/20661)
CHAPTER 31	EVALUATION OF AMMONIA NITROGEN REMOVAL IN AN EXISTING SEQUENTIAL BATCH REACTOR <i>Mohammed Saedi Jami, Suleyman Aremu Muyibi, and Nur Fazah Bt Ismail</i>	200 (5545/20664)
CHAPTER 32	PRODUCTION OF GLUCOAMYLASE FROM RICE BRAN USING	206 (4157/20666)

	POTENTIAL FUNGAL STRAINS	
	<i>Md Zahangir Alam, Hamzah Mohd Salleh, and Nurhidayah Binti Ahmad Hassan</i>	
CHAPTER 33	OPTIMIZATION OF PROCESS CONDITIONS FOR GLUCOAMYLASE PRODUCTION USING RICE BRAN	213 (4157/20668)
	<i>Md. Zahangir Alam, Hamzah Mohd Salleh, and Siti Najilaa Othman</i>	
CHAPTER 34	MEMBRANE PROCESS FOR REUSE OF TREATED PALM OIL MILL EFFLUENT (POME)	219 (5545/20672)
	<i>Mohammed Saedi Jami, Suleyman Aremu Muyibi, Siti Noor Hayati Abdul Kudus, and Munirat Idris Oseni</i>	
CHAPTER 35	PRODUCTION OF FERMENTABLE SUGAR FROM LIGNOCELLULOSIC MATERIALS USING STATISTICAL DESIGN	225 (4157/20674)
	<i>Md. Zahangir Alam, Abdullah-Al-Mamun, and Hikmah Mohd Noor</i>	
CHAPTER 36	STUDY OF THE DEWATERABILITY OF KAOLINE AS A MODEL SUBSTANCE FOR SLUDGE	231 (5545/20676)
	<i>Mohammed Saedi Jami, Tariq Jameel, Mardhiah Farhanah Bt Noor Izan, and Jabir Hussain</i>	
INDEX		237

CHAPTER 13

LOCAL SOURCING FOR RENEWABLE AND SUSTAINABLE REPLACEMENT FOR WATER AND WASTEWATER TREATMENT CHEMICALS: ACTIVATED CARBON FROM AGRO-WASTES

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ABSTRACT

The activated carbon produced in Malaysia is mostly from greenwood. Continued use of wood as raw material will result in the reduction in green cover of land and forests areas, the natural Malaysian national asset. Therefore it is necessary and urgent to seek for an alternative material like empty fruit bunch (EFB) with Malaysia currently producing more than 12 million tonnes annually to be used as a sustainable raw material for activated carbon production which will lead to forest conservation as well as reduction in solid waste environmental pollution and cost of waste treatment since the EFB as the basic raw material is obtainable at very minimum cost. Production of activated carbon from EFB will encourage its wide utilization by water and wastewater companies for its efficiency as well as its economic cost. This will lead to a good pollution control of surface water & ground water as the wastewater effluent will be of good quality.

Keywords: activated carbon, oil palm empty fruit bunch, water and wastewater treatment

INTRODUCTION

An area which needs serious attention will be the use of agro-waste such as empty fruit bunch for the production of activated carbon. Activated carbon has several important uses including: solution purification (as in the clean-up of cane, beet, and corn-sugar solutions), effective removal of tastes & odours from domestic and industrial water supplies, vegetable and animal fats and oils, chemicals and pharmaceuticals and in the waste water treatment. It also finds use in purification of gases, liquid phase recovery, separation processes and as catalyst and catalyst supports. Many organic compounds such as chlorinated & non-chlorinated solvents, gasoline, pesticides, and trihalomethanes can be adsorbed by activated carbon. It is also effective for removal of chlorine and moderately effective for removal of some heavy metals. Activated carbon has widely been used for the removal of inorganic and inorganic pollutants from aqueous solution. Various lignocellulosic materials or