

**EXTRACELLULAR BIOSYNTHESIS OF
IRON-BASED NANOPARTICLES FROM ISOLATED
BACTERIA FROM IRON WASTE SOIL**

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TABLE OF CONTENTS

	PAGE
ACKNOWLEDGEMENT	iii
TABLE OF CONTENTS	iv
LIST OF TABLES	vi
LIST OF FIGURES	vii
LIST OF ABBREVIATIONS	ix
ABSTRACT	x
ABSTRAK	xi
CHAPTER 1 INTRODUCTION	
1.1 Background Study	1
1.2 Problem Statement	2
1.3 Significance of Study	3
1.4 Objectives of Study	4
CHAPTER 2 LITERATURE REVIEW	
2.1 Nanoparticles	5
2.2 Physical, Chemical and Biological Synthesis of Nanoparticles	6
2.3 Mechanism of Biosynthesis of Nanoparticles by Bacteria	7
2.3.1 Intracellular	7
2.3.2 Extracellular	8
2.4 Bacteria Sample from Iron Waste Soil	9
2.5 Iron Nanoparticles Synthesized by Bacteria	10
2.6 Bacteria Identification	11
CHAPTER 3 METHODOLOGY	
3.1 Material	13
3.2.1 Raw materials	13
3.2.2 Chemicals	13
3.2.3 Apparatus	14
3.2 Method	14
3.2.1 Sample collection	14
3.2.2 Bacterial culture	14
3.2.3 Bacterial isolation	15
3.2.4 Stock culture	15

3.2.5	Iron nanoparticles screening	15
3.2.6	Identification of bacteria	16
3.2.7	Preparation of Standard Iron (III) oxide solution	17

CHAPTER 4 RESULTS AND DISCUSSIONS

4.1	Iron Nanoparticles Production	19
4.2	Bacteria Morphology	31
4.3	Motility Test	34
4.4	Catalase Test	37
4.5	Staining	38
	4.5.1 Gram Stain	38
	4.5.2 Acid-fast Stain	40
4.6	Indole Test	41
4.7	Methyl Red Test	43

CHAPTER 5 CONCLUSIONS AND RECOMMENDATION 46

CITED REFERENCES 47

CURRICULUM VITAE 52

ABSTRACT

EXTRACELLULAR BIOSYNTHESIS OF IRON-BASED NANOPARTICLES FROM ISOLATED BACTERIA FROM IRON WASTE SOIL

Microorganisms such as bacteria encompass a various range of enzymatic activity and capable of catalyzing a variety of biochemical reactions as well as evolve according to the environment they lived. Some of those bacteria are capable of converting the metal element to smaller particle known as nanoparticles. Nanoparticles have various used in daily life and needed to be produced in a way that can save the cost. The cost to produced nanoparticles can be cut down if it is produced in natural way by using bacteria. The aims of this study were to isolate, screen and identify the bacteria that can synthesize iron nanoparticles. The bacteria samples were obtained from iron waste soil in UiTM Jengka. The bacteria in each soil sample were grown in Luria agar and differentiated according to the shape of the colonies. Each isolates were grown in Luria broth and centrifuged to get the supernatant. The supernatants were mixed with Iron (III) Oxide, Fe_2O_3 , and screen for its ability to produce iron nanoparticles with Ultraviolet-Visible Spectrophotometry (UV-Vis) in the range 470 nm of wavelength and the colour changes of the solution from brick red to dark brown was observed. The result of this study shows out of 6 samples, bacteria E show remarkable result that utilized 40% of iron (III) oxide to form iron nanoparticles. Bacteria E is a Gram positive rod-shaped bacterium that are motile, catalase positive and give negative result to Acid-fast stain, Indole test and methyl red test. As the conclusion, Bacteria E is suggested to be from *Bacillus* group and potentially can be used in iron nanoparticles industries.