



**BIOREMEDIATION OF SOME HAZARDOUS
LIQUID WASTE USING BACTERIA AND
MOLECULAR DESCRIPTION FOR
TOLERANT ISOLATES OF IT**

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بسم الله الرحمن الرحيم

وَقُلْ اَعْمَلُوا فَسَيَرَى اللّٰهُ عَمَلَكُمْ وَرَسُولُهُ وَالْمُؤْمِنُونَ وَسَتُرَدُّونَ اِلَى عَالَمِ الْغَيْبِ
وَالشَّهَادَةِ فَيُنَبِّئُكُمْ بِمَا كُنْتُمْ تَعْمَلُونَ


صدق الله العظيم


(الايه ١٠٥ من سورة التوبه)


**This thesis has not been submitted for
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Dedication

***To my father, my brothers, my
sister, my husband, my children
and my late mother***

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Walaa Salah El-Din.

Abbreviations

APHA	American public health association
APS	Ammonium Persulfate
Biolife	Biolife company
BOD	Biochemical oxygen demand
CAT	Catalase
Cd	Cadmium
Co	Cobalt
COD	Chemical oxygen demand
CTAB	Cetyl trimethyl ammonium bromide
Difco	Difco company
DNA	Deoxyribonucleic acid
dNTPs	Deoxyribonucleotides triphosphates
DO	Dissolved oxygen
DWAF	Department of water affairs and forestry
EC	Electrical conductivity
EDTA	Ethylene diamine tetra acetic acid
EMB	Eosin Methylene Blue
FC	Faecal coliform
G.d	Genetic distance
Hg	Mercury
HMC	Heavy metal contamination
HPC	Heterotrophic plate count
ICP-OES	Inductively Coupled Argon Plasma- Optical Emission Spectroscopy
MBC	Minimum bactericidal concentration
MF	Membrane filter
m-FC	Modified-faecal coliform
MIC	Minimum inhibitory concentration
m-PA	Modified- <i>Pseudomonas aeruginosa</i>
PAGE	Polyacrylamide Gel Electrophoresis
Pb	Lead
PCR	Polymerase Chain Reaction
POX	Peroxidase
RAPD	Random Amplified polymorphic DNA

RNA	Ribonucleic acid
ROS	Reactive oxygen species
S.I.	Similarity index
SDS	Sodium dodecyl sulfate
SOD	Superoxide dismutase
TAE	Tri acetic EDTA
TC	Total coliform
TCA	Trichloroacetic acid
TDS	Total dissolved solid
TE	Tri/ EDTA buffer
TEM	Transmission Electron Microscopy
TEMED	N,N,N,N-Tetramethylethylenediamine
TSI	Triple sugar iron medium
TWQR	Target Water Quality Range for irrigation
WHO	World health organization

Symbols

µg	Microgram
µl	Microliter
cfu	Colony forming unit
Conc.	Concentration
g	Gram
h	hours
L	Liter
mg	Milligram
mg/l	Milligram per liter
min	Minute
mM	Millimoler
mS/m	milli-Siemens per meter
nm	Nanometer
°C	Degrees centigrade
rpm	Revolution per minute
Sec	Seconds
V	Volte
X	Power

Aim of the work

The plan of this study aims to the following;

- Study metal tolerance of isolated bacteria.
- Optimization of heavy metal removing by determination the effect of some important factors (pH, time, temperature, metal concentration and biomass concentration).
- Molecular description and differentiation between tolerant isolates treated and untreated with heavy metal ions through these points:
 - Catalase enzyme, lipoprotein, glycoprotein and protein were detected electrophoretically.
 - DNA of selected tolerant isolate was tested using RAPD-PCR assay.

These studies could be of great significance since the results could provide some information on the possible use of these tolerant bacterial isolates for bioremediation of heavy metals in metal contaminated environments.

Contents

Aim of the work

Abstract

REVIEW OF LITERATURE

1-Heavy metals-----	2
1-1- Occurrence in the environment-----	2
1-2- Heavy metal contamination-----	3
1-3- Heavy metal toxicity -----	5
2-Metal ion removing -----	6
2-1- Conventional methods-----	7
2-2- Biological methods (bioremediations)-----	8
3- Biosorption-----	10
3-1- Bacterial biosorption-----	11
3-2- Biosorption mechanism-----	12
3-3- Minimal inhibitory concentration (MIC)----	14
3-4-Factors affecting on biosorption-----	14
4-Molecular study of heavy metal tolerant bacteria-----	15
4-1- Molecular response of bacteria to heavy metal stress-----	16
4-1-1- Protein -----	16
4-1-2- Lipoprotein -----	16
4-1-3- Glycoprotein -----	17
4-1-4- Enzymes -----	18
4-1-5- Deoxyribonucleic acid (DNA)-----	19

Materials And Methods

Part I

1-Description of the studies area-----	21
2- Water and sediment samples collection -----	21
3- Physico-chemical analyses for the samples ----	23
4-Bacteriological analysis for wastewater samples-----	23
5-Isolation of different bacteria from wastewater samples-----	26
a-Isolation of <i>E. coli</i> -----	26
b-Isolation of <i>Salmonella</i> sp.-----	27
c-Isolation of <i>Pseudomonas aeruginosa</i> -----	28
d-Isolation of <i>Enterococcus</i> sp.-----	29
e-Isolation of <i>Staphylococcus aureus</i> -----	30
6- Maintenance of isolates -----	30
7- Confirmatory tests of isolated bacteria-----	31
8- Toxicity and biosorption of heavy metals-----	32
8-1-Toxicity-----	33
8-1-1-Response of isolated bacteria to heavy metals stress	33
8-1-2-Effects of heavy metals on bacterial growth-----	33
a-Determination of the growth Percentage under different metal concentrations -----	33
b-Determination of MIC and MBC-----	33
c-Transmission Electron Microscopy (TEM)-----	34
8-2- Biosorption percentage -----	35
8-2-1- Effect of different factors on biosorption - percentage -----	35
a-Effect of temperature- -----	35
b-Effect of pH-----	36
c-Effect of heavy metal concentration-----	36
d-Effect of incubation period-----	36

e-Effect of biomass concentration-----	37
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Part II

1- Molecular studies for tolerant isolates-----	37
a. Gel formulations (8%) -----	37
b. Sample preparation for Native-PAGE-----	39
c. Running conditions-----	40
d. Staining-----	40
e. Storage-drying solution-----	40
1-1- Protein electrophoresis-----	41
1-2-Lipoprotein electrophoresis-----	41
1-3-Glycoprotein electrophoresis-----	41
1-4-Catalase enzyme electrophoresis-----	42
1-5-DNA assay -----	43
a- Genomic DNA extraction-----	43
b-Amplification of genomic DNA by random amplified polymorphic DNA (RAPD-PCR)-----	45
c-Agarose gel electrophoresis-----	47
1-6-Data analysis-----	47

Results

Part I

1-Physico-chemical analyses of the samples-----	49
1-1-Temperature-----	49
1-2-Hydrogen ion concentration (pH)-----	49
1-3-Electrical conductivity (EC)-----	50
1-4-Total dissolved solids (TDS)-----	50
1-5-Dissolved oxygen (DO)-----	50
1-6-Biochemical oxygen demand (BOD)-----	50
1-7-Chemical oxygen demand (COD)-----	51
1-8-Heavy metals-----	51