Ain Shams University
Faculty of Women for Arts,
Science and Education

Bioleaching and Biosorption of Some Rare Earth Elements and Actinides from Soil Sample in Sinai.

A Thesis
Submitted in Partial Fulfillment of the Requirements for
The Degree of

Master of Science

in

Microbiology

by

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B. Sc Microbiology and Chemistry - 2007

to

Botany Department, Faculty of Women for Arts, Science and Education, Ain Shams University

2013

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Approval Sheet

Title: Bioleaching and Biosorption of Some Rare Earth Elements and Actinides from Soil Samples in Sinai.

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Dedication

I would like to dedicate this work to my wonderful mother Soaad, my great father Mohammed, my dear husband Moustafa my brothers, my sisters and my friends and also to express my sincere and deepest thanks to them for their great help and support.

Noha M. Kamal

Acknowledgments

First, I can't be thankful enough for Allah to whom I am indebted for his blessings on me.

I want to express my deepest appreciation and sincere gratitude to my supervisors for initially accepting me as a Master's Candidate and later on for their endless encouragement, constructive criticism, helpful and enlightening discussions, guidance during the preparation of this work, valuable ideas and basic editing.

My special thanks go to Dr. Mohammed Al-Ahmady and Dr. Tarek Amer, at Nuclear Materials Authority of Egypt for their great help during my study. I am also grateful to Ayman Mohammed, Mohammed Hussein and Naglaa Abd El-Kader for their technical assistance in the analysis of metals.

My special thanks also go to Dr. Wael Abo El-Wafa at The Applied Research Center of Medicinal Plants of the National Nutrition Institute of Ministry of Health and Population, Egypt, for his great support and help in identification of actinomycetes isolates.

Finally, I would like to extend my sincere appreciation and acknowledge to all doctors and colleagues in Botany Department, Ain Shams University whose names and contributions I cannot enumerate due to space limitation. To you all, I say *Thanks*!

Noha M. Kamal

List of Abbreviations

Ac	Actinides
ATSDR	Agency for Toxic Substances and Disease Registry
BLASTN	Basic Local Alignment Search Tool for Nucleotides
Ce	Cerium
CEC	Cation exchange capacity
CFU	Colony forming units
DCP	Dicalcium phosphate
EC	Electrical conductivity
EDX	Energy dispersive X-ray
EPS	Extracellular polymeric substances
Eu	Europium
FAA	Flame Atomic Absorption
Gd	Gadolinum
HGT	Horizontal gene transfer
HPGe	High Purity Germanium
HREEs	Heavy rare earth elements
IAEA	International Atomic Energy Agency
ICP-OES	Inductively Coupled Plasma Optical Emission Spectrometry
IQ	Intelligence Quotient
ISO	International Organization for Standardization
ISP	International *Streptomyces* Project
La	Lanthanum

LPS	Lipopolysaccharide
LREEs	Light rare earth elements
Lu	Lutetium
Mg	Magnesium
MIC	Minimum inhibitory concentration
MR-VP	Methyl red – Voges Proskauer
NCBI	National Centre for Biotechnology Information
NCRP	National Council on Radiation Protection and Measurements
Nd	Neodymium
OM	Organic matter
ppm	Parts per million
PGPR	Plant growth promoting rhizobacteria
Pr	Praseodymium
REEs	Rare earth elements
rpm	Round per minute
rRNA	Ribosomal Ribonucleic acid
Sc	Scandium
SEM	Scanning Electron Microscopy
Sm	Samarium
SRB	Sulphate-reducing bacteria
Th	Thorium
U	Uranium
USDA-NRCS	United States Department of Agriculture - Natural Resources Conservation Service
USEPA	United States Environmental Protection Agency

UV	Ultraviolet
VP	Voges-Proskauer
Y	Yttrium
Yb	Ytterbium
z	Atomic number

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