بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

"إِنَّ فِي خَلْقِ السَّمَاوَاتِ وَالْأَرْضِ وَاخْتِلَافِ اللَّيْلِ وَالنَّهَارِ لَآيَاتٍ لِّأُولِي الْأَلْبَابِ (190) "

صَدَقَ اللَّهُ العَظِيم

(ال عمران:190)

Ain Shams University
Faculty of Science
Chemistry Department

Wastewater Treatment Using Microorganisms Resistant to Heavy Metal and Isolated from Tannery Effluent

A Thesis

"Submitted for the degree of Master of Science as a partial fulfillment for requirements of the Master of Science"
In

Inorganic and Analytical Chemistry

Submitted by

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2017

Declaration

I declare that this thesis has been composed and the work recorded here has been done by me.

It has not been submitted for any other degree at this or any other university.

Taher Attiya Aboelazm

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ABSTRACT

In this study, 23 microbial isolates were isolated and tested for their ability to resist trivalent chromium and hexavalent chromium. Fungal isolates definitely D2 and 2NF proved high capability to resist trivalent and hexavalent chromium up to 15 mM and 5 mM respectively. D2 and 2NF were identified based on similarity of their 18S rRNA with analogs in genebank data. D2 belongs to aspergillus flavus strain USMG09 and 2NF belongs to fungal endophyte culture collection STRI:ICBG-Panama:TK1285 based on 99 and 99 % similarity. Pretreated biomass either by immobilization or chemical treatment proved high biosorption efficiency compared with dried native biomass. Immobilized biomass had high reduction percent of hexavalent chromium reached 100 % and high bioremoval percent of trivalent chromium reached 98.5 %.

LIST OF ABBREVIATIONS

Cr	Chromium
NPS	Non point source
ROS	Reactive oxygen species
M	Mannuoronic acid
G	Glucorunic acid
DP	Degree of polymerization
^{o}C	Degree Celsius
TBLPA	Tris buffered low phosphorous agar
SPD	Sabouraud dextrose agar
TSA	Tryptic soy agar
XRD	x-ray diffraction
FTIR	Fourier transform infrared
SEM	Scanning electron microscope
ICP	Inductively coupled plasma
BOD	Biological oxygen demand
COD	Chemical oxygen demand
TSS	Total suspended solids
mM	Millimolar
G	Grams
D2	Aspergillus flavus strain USMG09
2NF	Fungal endophyte culture collection STRI:ICBG-Panama:TK1285

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