بسم الله الرحمن الرحيم

شبكة المعلومـــــات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

﴿ قـــسـم ﴾

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Ain Shams University

The Effect of Nile Pollutants From Toxic Heavy Metals and Natural Radioelements Wastes on The Physiology of Certain Aquatic Weeds

By

Yasser Sayed Mahmoud Ramadan

B. Sc. and M.Sc. (Botany)

Thesis

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IN (Botany)

Supervised By

Hassan Foda

Prof. Dr. Hassan A. Foda

Professor of Plant Physiology

Ain Shams University

Raifa A. Hassanein

Prof. Dr. Raifa A. Hassanein

Professor of Plant Physiology

Ain Shams University

M.B.H

Prof.Dr.Mohamed B. Hafez

Professor of Radiation Chemistry

Hot Laboratories Center

Atomic Energy Authority

N. Hafez

Prof. Dr. Nabil S. Hafez

Professor of Radiation Chemistry

Hot Laboratories Center

Atomic Energy Authority

Botany Department

Faculty of Science

Ain Shams University

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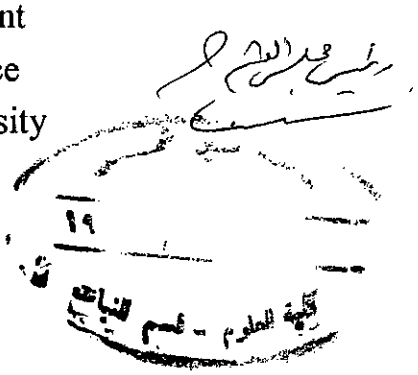

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مجلس الكلية على تقديم الرسالة بتاريخ ٥/٨/١٩٩٩

لجنة الإشراف: أ.د. محمد سيد أحمد طايل

أ.د. [illegible]

أ.د. محمود [illegible]

مجلس الكلية على منح الدرجة بتاريخ _____

Approval Sheet

Title of Thesis : The Effect of Nile Pollutants From Toxic Heavy Metals and Natural Radioelements Wastes on The Physiology of Certain Aquatic Weeds

By
Yasser Sayed Mahmoud Ramadan
(B. Sc. & M. Sc.)

This Thesis for Ph. D. Degree has approved by :

Prof. Dr. Raifa Ahmed Hassanein.
Professor of Plant Physiology, Faculty of Science, Ain Shams University.

Prof. Dr. Mohamed Bader Hafez.
Professor of Radiation Chemistry, Hot Laboratories center, Atomic Energy Authority.

Prof. Dr. Taymour Hussain Kamal.
Professor of Radiation Biology, Nuclear Research Center, Atomic Energy Authority.

Prof. Dr. Mahmoud Mohamed Ali Gaber.
Professor of Plant Physiology, Faculty of Science, Cairo University.

Date: / / 1999

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ABSTRACT

Name : Yasser Sayed Mahmoud Ramadan

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Due to large production of both low level radioactive liquid and toxic industrial wastes, aquatic plants are used to absorb undesirable ions from waste solutions. The present work illustrates, the uptake of some metal ions existed in low level liquid radioactive or industrial wastes namely U VI, Th IV, Ce III, Fe III, KMnO4, Cu II, Pb II, Ni II, Cd II and phenol by *Eichornia crassipes* or *Potamogeton crispus* plant. The uptake process was performed for each metal ions, and in presence of some additives then for groups of metals, which represent, the radioactive and toxic wastes. The changes in photosynthetic pigments of the leaf, toxicity index and the carbohydrate contents of *Eichornia crassipes* and *Potamogeton crispus* plants before, during and after the uptake process were determined. The obtained results were supported by applying electron microscope techniques to examine the photosynthetic apparatus.

The effects of some environmental parameters such as pH, temperature, concentration, interference of some additives and plant age on the uptake and accumulation of the studied elements by the two aquatic plants were also investigated.

The variation in mineral composition of *Eichornia crassipes* plant at different sites along Ismailia canal compared with the mineral composition in water at these

sites showed that, Fe, Ni, Cd and Pb ions were accumulated in roots in greater amounts than in shoots, while a reverse pattern was shown concerning Cu ions accumulation. In addition, the distribution of Mn ions was shown to be nearly the same in both shoots and roots of *Eichornia crassipes* plants. It is of interest to mention here that one gram of *Eichornia* roots can accumulate 8.2, 7.2, 3.4, 1.6 and 1.2 times from Fe, Mn, Cd, Ni and Pb ions respectively as those recorded in water. These absorbed metal ions did not affect the photosynthetic pigment contents and the carbohydrate levels indicating that this plant is tolerant to the absorbed concentrations of metal ions.

The two examined plants revealed specific pattern for the uptake of studied metal ions, with regard to time. They could be used as bioindicator to monitor their existence in fresh water environment. They can detect such metal ions if possible radioactive contamination in the surrounding environmental water is occurred. *Eichornia crassipes* and *Potamogeton crispus* could be used eventually for treatment of low level liquid radioactive or toxic wastes. It can be recommended that the treated plants with the studied metal ions should be collected directly after 10 hours of the beginning of the uptake.

Contents

	Page
List of Figures	
List of Tables	
List of Plates	
Introduction	1
Review of Literature	4-29
Material and Methods	30-40
A- Material	30
1- Experimental aquatic plants	30
2- Chemicals	31
3- Apparatus	33
B- Experimental Methods	35
1- Maintenance of plants	35
2- Determination of thorium	35
3- Determination of uranium	36
4- Determination of heavy metals in plant tissues	36
5- Determination of the photosynthetic pigments	37
6- Estimation of carbohydrates	37
7- Transimission electron microscopic determination	39
Safety precautions	40
Results	41
I - Effect of Toxic Ions on Certain Aquatic Plants	41
1- Effect of Toxic Ions on *Eichornia Crassipes*	41
1.1- Uptake of toxic ions by *Eichornia crassipes*	41
1.1.1- Uptake of U VI by *Eichornia crassipes*	41
a- Effect of *Eichornia crassipes* age on the uptake process	41
b- Effect of pH of U VI solution on the uptake process by *Eichornia crassipes*	44
c- Effect of temperature on the uptake of U VI solution by *Eichornia crassipes*	46
d- Effect of concentration on the uptake of U VI by *Eichornia crassipes*	48
e- Uptake of U VI by *Eichornia crassipes* in presence of different additives	53

1- Uptake of U VI by *Eichornia crassipes* in presence of NaCl 53
2- Uptake of U VI by *Eichornia crassipes* in presence of $MgCl_2$ 56
3- Uptake of U VI by *Eichornia crassipes* in presence of $CaCl_2$ 59
4- Uptake of U VI by *Eichornia crassipes* in presence of $FeCl_3$ 59
5- Uptake of U VI by *Eichornia crassipes* in presence of KNO_3 62
6- Uptake of U VI by *Eichornia crassipes* in presence of $(NH_4)_2SO_4$ 68
7- Uptake of U VI by *Eichornia crassipes* in presence of $Pb(NO_3)_2$ 68
1.1.2- Uptake of Th IV by *Eichornia crassipes* 72
1.1.3- Uptake of Ce III sulphate by *Eichornia crassipes* 72
1.1.4- Uptake of Fe III by *Eichornia crassipes* 78
1.1.5- Uptake of $KMnO_4$ by *Eichornia crassipes* 82
1.1.6- Uptake of Cu II by *Eichornia crassipes* 82
1.1.7- Uptake of Pb II by *Eichornia crassipes* 85
1.1.8- Uptake of Cd II by *Eichornia crassipes* 90
1.1.9- Uptake of Ni II by *Eichornia crassipes* 93
1.1.10- Uptake of phenol by *Eichornia crassipes* 93
1.1.11- Uptake of U VI, Th IV, Fe III and $KMnO_4$ from simulated industrial wastes by *Eichornia crassipes* 98
1.1.12- Uptake of mixture from Pb II, Cd II and Ni II from simulated industrial wastes by *Eichornia crassipes* 98
1.1.13- Uptake of phenol from industrial wastes (coal tar) by *Eichornia crassipes* 100
1.2- Changes in photosynthetic pigments content of *Eichornia crassipes* leaves in response to the uptake of metal ions 104
1.3- Changes in carbohydrates contents of *Eichornia crassipes* in response to the uptake of metal ions 123
1.4- Ultrastructural Changes in the *Eichornia* cells due to their immersion in metal ion solutions 132