Accumulation of heavy metals by some aquatic macrophyta as an indicator of pollution (Ward El-Nile)

By

RADWAN MOHAMED RADWAN

B.Sc. Faculty of Agric., Zagazeg Univ. (1976)

High Diploma (Soil Science), Al-Azhar Univ., (1983)

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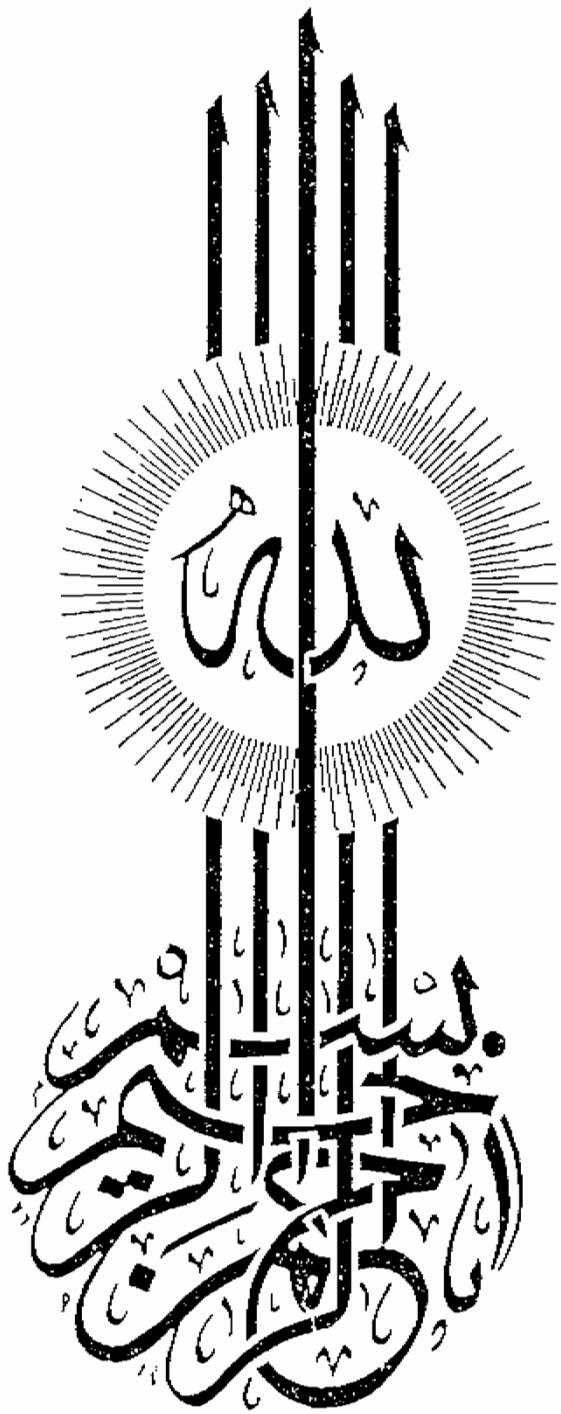
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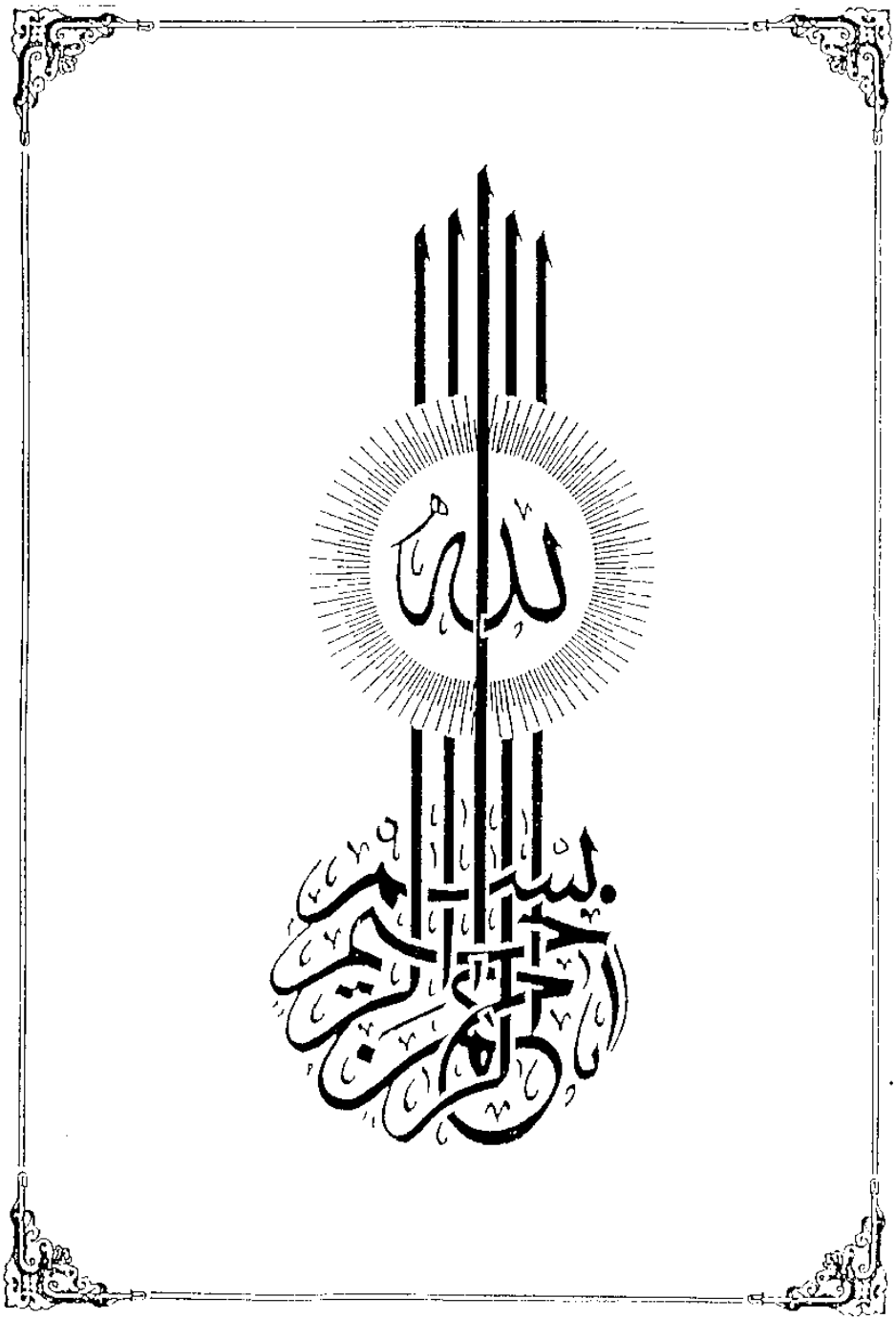

APPROVAL SHEET

ACCUMULATION OF HEAVY METALS BY SOME AQUATIC MACROPHYTA AS AN INDICATOR OF POLLUTION (WARD EL- NILE)

By

Radwan Mohamed Radwan

B.Sc. Facultuy of Agric., Zagazeg Univ. (1976)

This thesis for M.Sc. degree has been approved by

Prof. Dr. A.S. Ismail ....A.S.Ismail.....

Professor of Soil Science, Fac. of Agric., Ain-Shams Univ. (Supervisor).

Prof. Dr. A. F. El-Kholi .El.Kholi.....

Professor of Soil and Plant Nutrition, Atomic Energy Authority

Prof. Dr. M. Talha .....Talha.....

Professor of Soil physics, Fac. of Agric., Ain-Shams Univ.

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INTRODUCTION

I - Introduction

Water hyacinth (Eichhornia crassipes) is considered as one of the worst aquatic weeds which effect the fresh water pathways. Water hyacinth reproduces rapidly if it is left without any effective control. Many attempts have been made to use water hyacinth in different countries. It is recognized as a potential supply of biomass lies in its enormous reproduction capacity.

Water hyacinth have received a great attention during the recent years as possible economic biological system for reducing trace elements from waste water, or for minimizing water pollution as general and hence to improve the water quality. Since, the end products of the degraded organic pollutants are carbon dioxide, ammonia, phosphate and sulphate which are mainly adsorbed by water hyacinth through the roots. It is reported that ponds with water hyacinth are much more effective in the removal of pollutants than conventional treatment processes. However, it is not fully understood the mechanism of heavy metal absorption by the floating hyacinth plant.

Surface water pollution by heavy metals results mainly from industrial waste water and sewage effluent discharged into water bodies as well as land runoff . This problem has recently attracted the attention of the researches in Egypt. Consequently, more

knowledge about the presence of these metals in Egyptian aquatic environment is needed.

The aims of this study are to evaluate the use of water hyacinth plant as a biological indicator for zinc, copper and lead levels and accumulation in the aquatic system. Moreover, to investigate the capability of such plant to be used as a biological indicator for wastewater to minimize its levels of pollutants.

REVIEW OF LITERATURE

II - REVIEW OF LITERATURE

2.1. Description of water hyacinth plant

Water-hyacinth (Eichhornia-crassipes solms) is one of numerous aquatic plants. It is a large free-floating plant with attractive lavender flower and shiny bright-green leaves on long petioles. The plants are found mainly in ponds and slow flowing streams. They are normally free-floating but, if stranded by receding water, will root in mud and survive. Uncrowded plants, particularly in shallow water and full sunlight, have bulbular float petioles about 8 incheds long, whereas crowded plants produce elongate petioles upto 50 inches long (Penfound and Earle, 1948). They also suggested the following plant size classes : midget, small,medium, large and gaint : The midget being rooted on land, small being in full flower in shallow water, medium existing in still water often profusely flowered, large and gaint size thriving in moving, well-areated water of canals. The latter are distinguished by elongated equitant leaves upto 50 inches long with float leaves being non-existent.

2.2. Historical:

Water-hyacinth (Eichhorina crassipes solms) is one of the most bad weed in the world. It has spread from the American tropics and assumed a largely pan-tropical distribution (Simpson, 1932, Bose, 1945; Parham, 1947; Meadly, 1953; Mendonca, 1958; Allsopp, 1960 and Bock 1969). Percheron (1903) mentioned the cultivation of