



شبكة المعلومات الجامعية

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ





شبكة المعلومات الجامعية

# جامعة عين شمس

التوثيق الالكتروني والميكرو فيلم

## قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها  
علي هذه الأفلام قد أعدت دون أية تغيرات



## يجب أن

تحفظ هذه الأفلام بعيدا عن الغبار

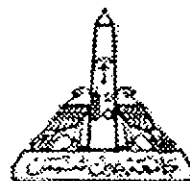
في درجة حرارة من 15-25 مئوية ورطوبة نسبية من 20-40%

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شبكة المعلومات الجامعية  
التوثيق الالكتروني والميكرو فيلم

Ain Shams University  
Environmental Studies  
and Research Institute



**MOSSES AS A BIOINDICATOR OF HEAVY  
METALS POLLUTION IN GREAT CAIRO.**

By

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B.Sc. Faculty of Science (Botany), 1986,  
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Ain Shams University, 1991

**A thesis submitted in partial fulfillment**

**Of**

**The requirements for the master degree**

**In**

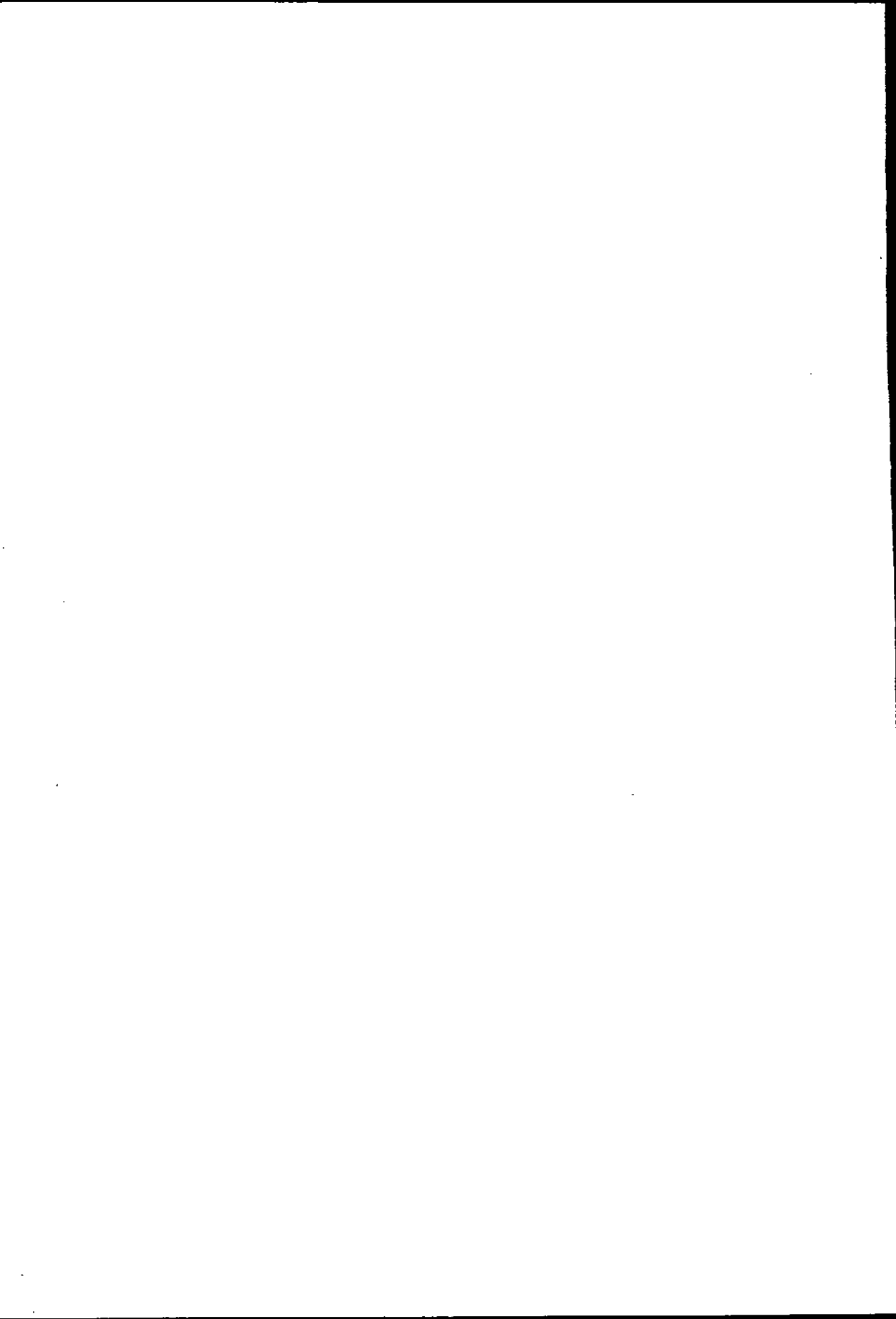
**Environmental Sciences**

**Department of Biological and Natural Sciences**

**Institute of Environmental Studies and Research**

**Ain Shams University**

**2000**



## Approval sheet

### **MOSSES AS A BIOINDICATOR OF HEAVY METALS POLLUTION IN GREAT CAIRO.**

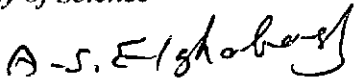
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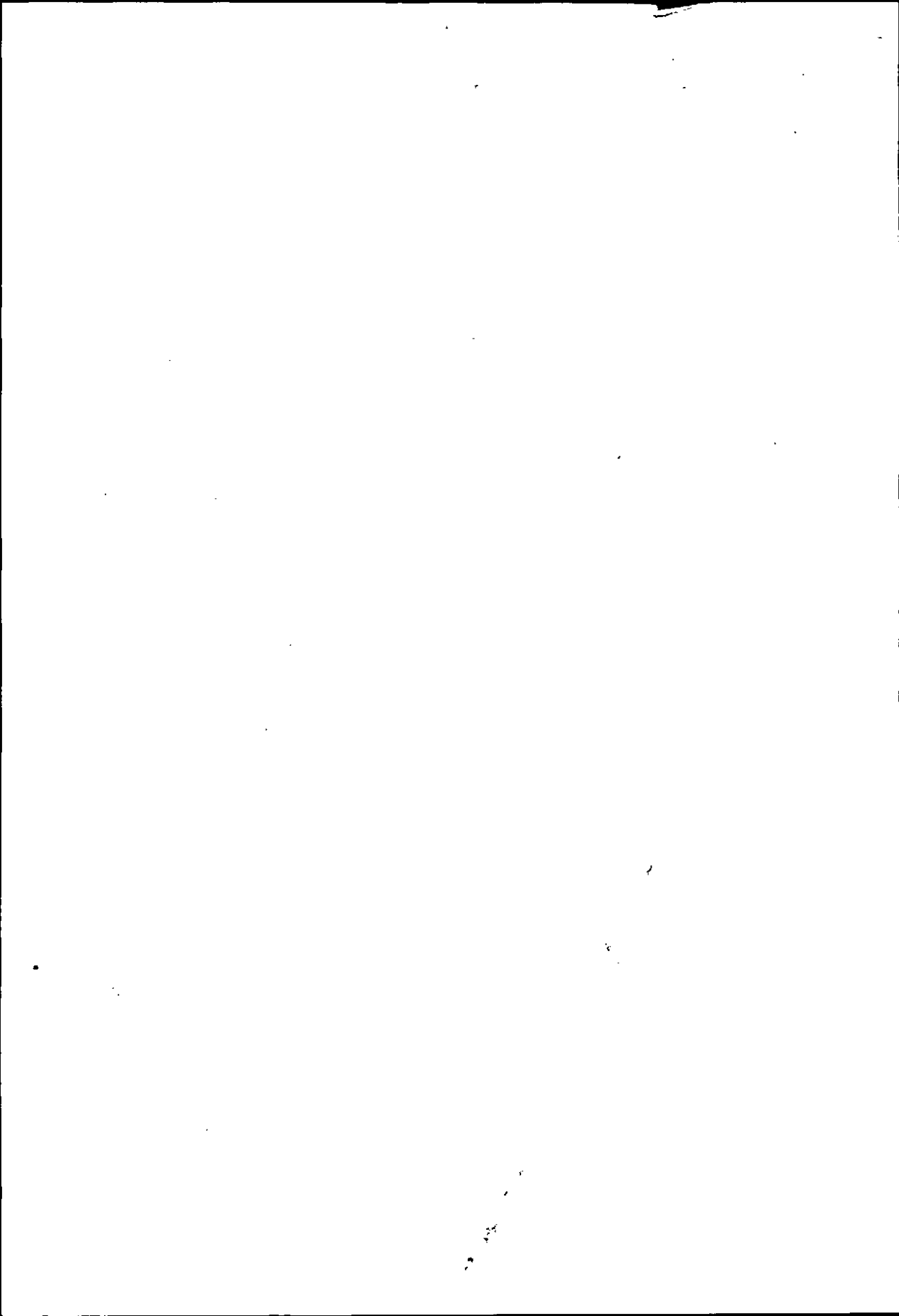
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2000



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## ABSTRACT

**Name:** Mohamed Osman Mohamed Osman  
**Title :** Mosses as a bioindicator of heavy metals pollution in Great Cairo.  
**Degree:** Master of Environmental Biological Science  
**Submitted to:** Department of Biological and Natural Sciences, Institute of Environmental Studies and Research, Ain Shams University.

This work is an attempt to investigate the suitability of Egyptian mosses as a bioindicator of air pollution of heavy metals in Great Cairo. For achieving this purpose ,seven moss species belong to four genera: *Barbula*, *Bryum*, *Funaria* and *Physcomitrium* were collecting from one site or more of 23 selected sites distributed in five different regions in two provinces (Cairo & Qualiobiya) in Great Cairo

### The present study included

- 1- Description and identification of the studied mosses .
- 2- Anatomy and morphology of the studied mosses.

- 3- Determination of the content of heavy metals (Pb, Cu, Zn, Cd, Mn & Fe) in plant tissue, soil substrate and water in the vicinity of the studied mosses as well as on the plant surfaces of these mosses.
- 4- Measurement of Leaf area index.

**The study revealed the following:**

- 1-A positive relation was found between the concentrations of some heavy metals in plant tissue and soil.
- 2-No obvious effect was observed on the anatomy and morphology of the studied mosses as a result of pollution by heavy metals.
- 3-The value of LAI for some species was in direct proportional with content of heavy metals in the different sites.
- 4-Comparison of the obtained results indicated that plant tissue analysis is the best procedure to indicate the suitability of bryophytes as a bioindicator for air pollution by heavy metals.

**Key words** : Mosses - bioindicator - Pollution - heavy metals.

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