



شبكة المعلومات الجامعية

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ





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## التوثيق الالكتروني والميكرو فيلم

# جامعة عين شمس

التوثيق الالكتروني والميكرو فيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها  
على هذه الأفلام قد اعدت دون أية تغيرات



يجب أن

تحفظ هذه الأفلام بعيداً عن الغبار

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

To be kept away from dust in dry cool place of  
15 – 25c and relative humidity 20-40 %



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# بعض الوثائق الأصلية تالفة



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بالرسالة صفحات

لم ترد بالأصل

# **GENETIC STUDIES ON SOME BACTERIAL HEAVY METAL RESISTANCE GENES**

By

**Amr Tag El-Din Mahmoud Sa'eb**

B.Sc.Agric.Sci. (Genetics), Ain Shams University (1994)

**A thesis submitted in partial fulfillment  
of  
the requirements for the degree of**

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in**

**Agricultural Science  
(Genetics)**

**Genetics Department  
Faculty of Agriculture  
Ain Shams University**

**2000**

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7101



## Approval sheet

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Date of Examination: 31 / 5 / 2000



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## ABSTRACT

**Amr Tag El-Din Mahmoud Sa'eb, Genetic Studies on Some Bacterial Heavy Metal Resistance Genes. Unpublished Master of Science thesis . Genetics Department, Faculty of Agriculture, Ain Shams University, 2000.**

Two hundred forty nine *Pseudomonas* isolates were collected from different geographical sites in Egypt. These isolates were examined for resistance against ten heavy metals and five antibiotics. Plasmid profile were studied for most of tested isolates. For further studies ten representative strains were chosen. They were resistant to seven to nine heavy metals and four to five antibiotics and bearing both small and large conjugative plasmids. They have stable, broad host range plasmids. Silver, nickel, cadmium, mercury, cobalt, chromium, copper, zinc, chloramphenicol, kanamycin, tetracycline, ampicillin and streptomycin resistance genes were plasmid borne, while lead and iron resistance genes were chromosome mediated.

**Key words:** *Pseudomonas*; heavy metals; antibiotics; resistance plasmid; curing; conjugation; broad host range; genetic stability.

