# بسم الله الرحمن الرحيم


MONA MAGHRABY


# شبكة المعلومات الجامعية

# التوثيق الالكتروني والميكروفيلم

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التوثيق الإلكتروني والميكروفيلم

# جامعة عين شمس

# التوثيق الإلكتروني والميكروفيلم

# قسم

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

# يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

***MONA MAGHRABY***

**Faculty of Women for Arts, Science& Education**
**Zoology Department**

# Effect of *Nigella sativa* on silver nanoparticles induced hepato-nephrotoxicity in *Clarias gariepinus*

Thesis

Submitted in partial fulfillment for the requirements for the degree of Master of Science in Zoology

**By**

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**2021**

# DEDICATION

*To my Kind*

*Parents*

*To my*

*Faithful Brother*

*Kyrillos Gamal*

# Qualifications

**Name : Nermein Gamal Andrawes**

**Scientific Degree: B.Sc.**

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**College : Faculty of women for Arts, Science & Education**

**University : Ain Shams University**

**Graduation year : 2013**

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**Courses studied by the candidate in partial fulfillment of the requirements for the degree of M.Sc.**

**1-Physiology**

**2- Histology**

**3- Immunology**

**4- Toxicology**

**5- Ethics of scientific research**

**6- Writing scientific research**

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# ABSTRACT

## Effect of *Nigella sativa* on silver nanoparticles induced hepato-nephrotoxicity in *Clarias gariepinus*

Silver nanoparticles (Ag-NPs) is effectively used in varied aquaculture applications. This study aimed to determine $LC_{50}$ of (Ag-NPs) in African catfish *(Clarias gariepinus*) as well as the protective role of *Nigella sativa* (NS) against Ag-NPs toxicity. Fish were divided into 4 groups of triplicates as follows: group I: was showed as control, group II: was fed on 3% NS inclusion diet, group III: was exposed to 50 mg/L Ag-NPs and group IV exposed to 50 mg/L Ag-NPs and fed on 3% NS for 30 days.

At the end of experiment blood collected for biochemical analysis. As well as liver and kidney tissues of catfish were taken for oxidative enzymes, DNA analysis and histopatholgical studies.

The results exhibited that exposed of catfish with 50 mg/L Ag-NPs lead to a marked increase in liver enzymes Alkaline phosphatase (ALP), alanine amino transferase (ALT) and Aspartate amino transferase (AST). Also, these increases were indicated in kidney activities (urea, creatinine, and uric acid). Levels of total proteins, albumin and globulin were markdly increased. However, A/G ratio decreased. Also, glucose, cortisol and lactate dehydrogenase (LDH) levels were significantly increased. and total lipids levels (cholesterol and triglyceride) were increased. On the other and, African catfish exposed to Ag-NPs showed significant ($p<0.05$) elevation in the level of Lipid peroxidation (LPO) of liver and kidney tissues. These results indicated that the levels of reduction glutation (GSH), catalase (CAT), superoxide dismutase (SOD), and total antioxidant capacity (TAC) increased compared to the control fish after exposure to 50 mg/L Ag-NPs for 30 days.

Furthermore, percentage of DNA damage in both liver and kidney tissue of African catfish exposed to 50 mg/L Ag-NPs significantly increased.

Histological study in hepatic and renal tissues of African catfish represented more damage and alternation in tissues that exposed to 50 mg/L Ag-NPs for 30 days compare to control group and treatment group with 3% NS. It is concluded that the feeding of African catfish on a (NS) enriched diet minimized the destructive impacts of Ag-NPs toxicity and restored the above-mentioned variable near to the control group. The current investigation has revealed that dietary NS has antagonistic functions against Ag-NPs toxicity in African catfish.

**Key words:** Silver nanoparticles

*Clarias gariepinus*

*Nigella Sativa*

Biochemistry

DNA fragmentation

Histopathology.

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