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شبكة المعلومات الجامعية

# بسم الله الرحمن الرحيم



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شبكة المعلومات الجامعية



# شبكة المعلومات الجامعية التوثيق الالكتروني والميكرو فيلم





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شبكة المعلومات الجامعية

# جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

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بالرسالة صفحات  
لم ترد بالأصل



**BIOLOGICAL STUDIES ON THE RED SWAMP  
CRAWFISH *PROCAMBARUS CLARKII*  
(GIRARD, 1852) (DECAPODA: CAMBARIDAE)  
IN THE RIVER NILE, EGYPT**

**A thesis Submitted in fulfillment of the requirements for the  
Ph.D. Degree**

**In  
Zoology**

**By  
Salwa Abdel-Hamid Hamdi**

**Department of Zoology  
Faculty of Science  
Cairo University**

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## APPROVAL SHEET FOR SUBMISSION

**Title:** Biological Studies on the Red Swamp Crawfish  
*Procambarus clarkii* (Girard, 1852) (Decapoda:  
Cambaridae) in the River Nile, Egypt

**Degree :** Ph.D. in Zoology

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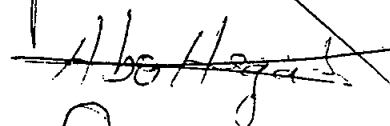
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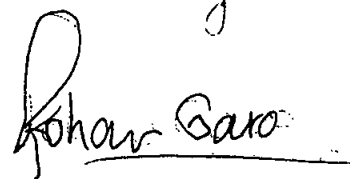
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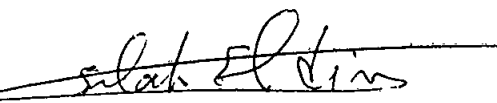
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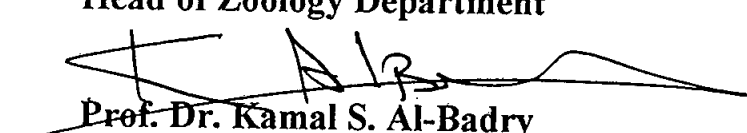


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### **ABSTRACT**

The present study deals with the physiological changes in the haemolymph, hepatopancreas and muscles of the red swamp crawfish *Procambarus clarkii* exposed to the organophosphorous pesticide malathion in acute and chronic doses during different time intervals.

This study showed that malathion is toxic to *P. clarkii*, the 96 hrs LC<sub>50</sub> being 3.706 mg/l (ppm). The results revealed that there was a highly significant elevation in haemolymph glucose, ASAT, ALAT enzymes, creatinine, uric acid and potassium concentrations after acute and chronic exposure to malathion. However, a gradual decrease was recorded in the haemolymph total lipid and sodium concentrations but a sudden increase was encountered after 6 weeks of chronic exposure.

Hepatopancreatic analysis of *P. clarkii* showed a decrease in the water content, total protein, glycogen, hepatosomatic index (HSI) and cholesterol after exposure to acute and chronic doses of malathion. However, an increase was recorded in the total lipid concentrations. Hepatic and muscle ASAT and ALAT showed a significant decrease throughout the entire experimental period of acute and chronic exposure to malathion.



It was found that there was an increase in muscle total lipid, and a decrease in muscle water content and total protein after acute exposure to malathion. However, on chronic exposure, there were insignificant differences in the muscle total lipid, total protein and water content throughout the experimental period compared to the control values.

Regarding the histopathological examination, after acute exposure (3hrs to 96 hrs) slight signs of degeneration in the hepatopancreas in the form of vacuolation as well as some changes occurred in the gland and secretory cells of the tubules. On the other hand, after chronic exposure, from 2 weeks onwards to 2 months, vacuolation was observed in a vast number of tubules. However, some signs of recovery occurred from 45 days onwards.

**Key words:** *Procambarus clarkii*, malathion, toxicity, haemolymph, hepatopancreas, muscle, total protein, total lipid, ALAT, ASAT, creatinine, uric acid, Na<sup>+</sup>, K<sup>+</sup>, triglycerides, cholesterol, water content

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