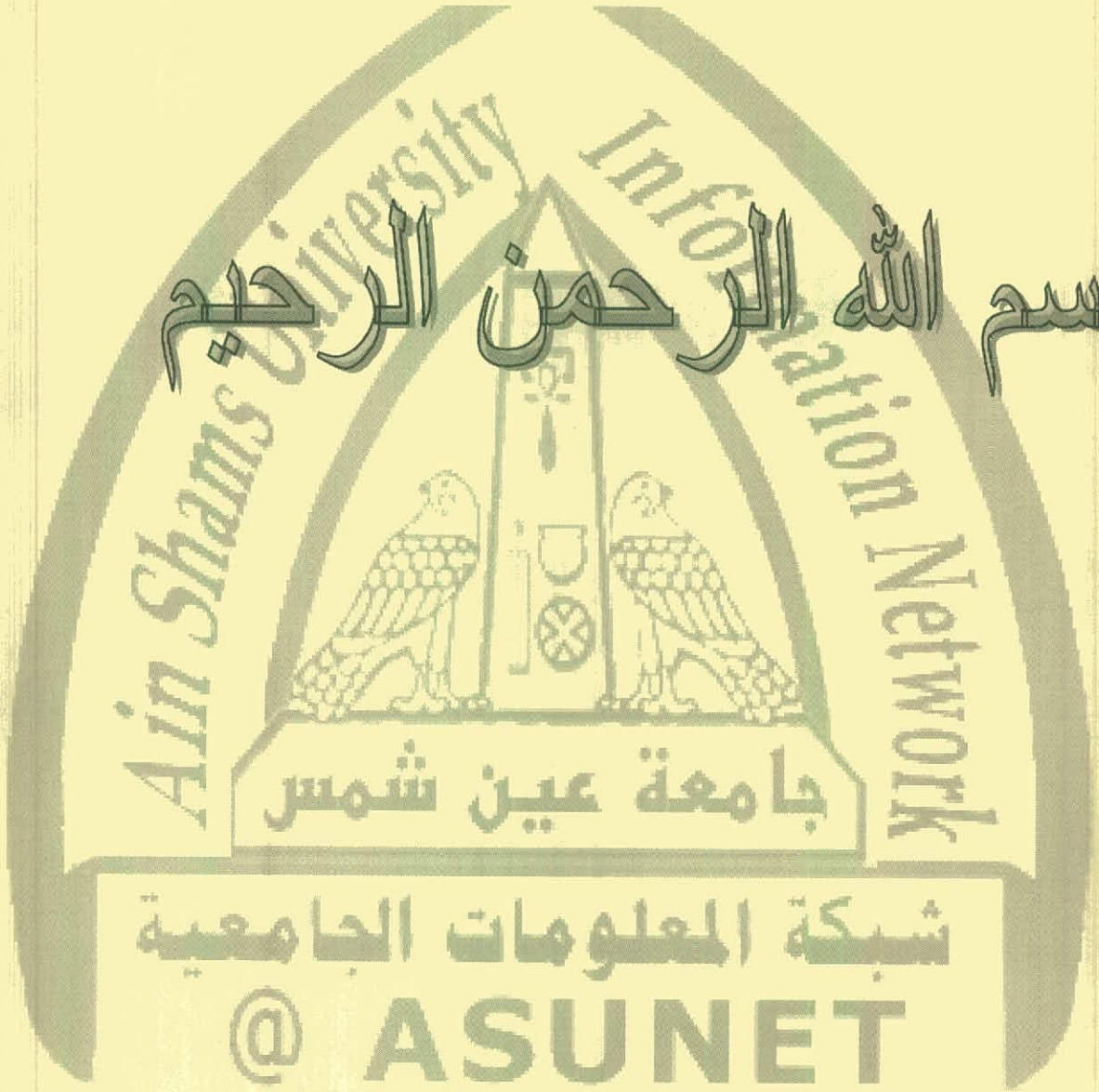
شبكة المعلومات الجامعية



بسم الله الرحمن الرحيم

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

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 ١٥-٢٥ مئوية ورطوبة نسبية من ٢٠-٤٠%

To be Kept away from Dust in Dry Cool place of 15-25- c and relative humidity 20-40%

بعض الوثائـــــــق الاصليـــــة تالفـــة

بالرسالة صفحات لم ترد بالاصل

Zagazig University
(Benha Branch)
Faculty of Science
Zoology Department

Some Biophysiological Effects Of "Bromadiolone" On White Rat

Thesis
Submitted for the degree of
Doctor of Philosophy
of Science
(Animal Physiology)

BY
AZZA MAHMOUD AWAD

Supervisors

Dr. M. Abdel Halim
Associate Professor
of Physiology
Faculty of Science
Benha

Dr. Aziza A. El-Shafey
Associate Professor
of Physiology
Faculty of Science
Benha

Dr. Moshera M. Ezzat
Lecturer of Zoology
Faculty of Science
Benha

1998

Zagazig University
(Benha Branch)
Faculty of Science
Zoology Department

Some Biophysiological Effects Of "Bromadiolone" On White Rat

Thesis
Submitted for the degree of
Doctor of Philosophy
of Science
(Animal Physiology)

BY
AZZA MAHMOUD AWAD

Supervisors

Dr. M. Abdel Halim
Associate Professor
of Physiology
Faculty of Science
Benha

Dr. Aziza A. El-Shafey
Associate Professor
of Physiology
Faculty of Science
Benha

Dr. Moshera M. Ezzat
Lecturer of Zoology
Faculty of Science
Benha

1998

بسم الله الرحمن الرحيم

" قالوا سبحانك لا علم لنا إلا ما علمتنا إنك
أنت العليم الحكيم "

سورة البقرة آية (٣٢) صدق الله العظيم

TO THE MEMORY OF MY MOTHER

ACKNOWLEDGMENT

I would like to express my gratitude to **Dr. Mohamed S. Abdel Halim**, Associate Professor of physiology, Zoology Department, Faculty of Science, Zagazig University, Benha Branch, for his fruitful supervision, suggesting the point of research, his kind guidance , encouragement, and valuable comments.

Sincere thanks to **Dr. Azziza A. El-Shafey**, Associate Professor of physiology, Zoology Department, Faculty of Science, Zagazig University, Benha Branch, for her valuable supervision, suggesting the point of research, continuous help throughout the work and to perform this work in its final form.

Deep thanks due to **Dr. Moshera M. Ezzat**, Lecturer of Zoology, Zoology Department, Faculty of Science, Zagazig University, Benha Branch, for her supervision, continuous and true help during this study as well as valuable discussion.

I want to record my deep thanks to **Prof. Dr. Sabry S. El-Serafey**, Vice Dean of the Faculty of Science for environment , Zagazig University, Benha Branch, for his valuable supporting and facilitate many problems during this work.

Deep thanks to all the members and colleagues of Zoology Department, Faculty of Science at Benha, for kindly help and encouragement.

Heartfull thanks to my husband **Dr. M. Abdel Wahab and my daughters Maie, Mariam and Nora** for their encouragement.

CONTENTS

INTRODUCTION

Introduction

The wide spread use of anticoagulant rodenticides for eradication of rodents in fields , houses and other locations makes it possible that such compounds would reach the food of non target animal or even human beings (Abdel-Raheem *et al.*, 1986 e) .

Therefore, this study investigate the physiological and biochemical responses of the rat *Rattus norvegicus* to bromadiolone as one of the most usable rodenticide. This study includes the effect of three sublethal doses of bromadiolone on blood respiratory function; (blood gases, acid - base status, and oxygen equilibrium curve). The study includes also the effect of the rodenticide (bromadiolone) on biochemical parameters including total protein, total lipid as an indication of the amino acids and fatty acids metabolism respectively in blood and tissues of the studied rat, glucose concentration , transaminase enzymes activity AST (GOT), ALT (GPT) and alkaline phosphatase activity were also studied. In addition blood parameters including erythrocyte count (RBCs), white blood corpuscles count (WBCs), hemoglobin content (Hb) and haematocrit value (Hct) were determined. Teisseire *et al.* (1979) studied the effects of chronic changes in hemoglobin-O_2 affinity in rats and found that an increased blood O_2 affinity or decrease in P_{50} are typical for species adapted to altitude and appears physiologically advantageous when arterial PO_2 is abnormally low. Fregosi and Dempsey (1984) described the effects of exercise on arterial acid-base status and examined the role of chemical stimuli as determinants of the hyperventilation in male wistar rats. They reported that during mild exercise CO_2 production (VCO_2), arterial lactate, arterial PO_2 ($P_a O_2$), and rectal temperature were found increased.

Eissa *et al.* (1988a) studied the factors affecting oxygen loading of blood of two Egyptian rodents *Jaculus jaculus* and *Arvicanthis niloticus* and found that the oxygen equilibrium curves of both studied animals are shifted to the left by low temperature and high pH values, and to the right by high temperature and low pH values. Eissa *et al.* (1988b) studied also the regulation of acid- base status of blood of two rodents in relation to the adaptation to desert habitat and found that at laboratory temperature (25°C,) arterial and venous blood pH of the desert Egyptian jerboa, *Jaculus jaculus* are higher than those of the Nile grass rat, *Arvicanthis niloticus.* Bicarbonate and total CO_2 values of arterial and venous blood of the jerboa are higher than those of the grass rat. As ambient temperature changes from (25°C) to low or high, the arterial and venous blood pH, [HCO_3^-] and total CO_2 values of both rodents vary differently from other previously studied mammals, and even between each other . El-Shafey (1990) studied the effect of reserpine on the respiratory function of the blood of the Nile grass rat; *Arivacanthis niloticus.* and found that after ten minutes of reserpine administration, PO_2 of arterial and venous blood as well as the calculated PO_2 were greatly reduced. In arterial and venous blood , pH decreased and PCO_2, [HCO_3^-] and total CO_2 increased. After 1 and 2 hours , arterial, venous and calculated alveolar blood PO_2 remained lower than the normal values, After 24 hour, all the PO_2 values became close to the normal values. The blood oxygen equilibrium curve, blood oxygen affinity and P_{50} were greatly and differently affected by reserpine administration. The P_{50} value became close to normal value after 24 hours. Svendsen *et al.* (1990) studied the acid-base status and cardiovascular function in pigs anaesthetized with alpha- chloralose and found that animals maintained under spontaneous respiration had a stable but subnormal arterial blood pressure. Heart rate was within the normal range. Respiration was depressed , causing elevated PCO_2 and respiratory acidosis. Artificial ventilation with a minute volume

of 0.15 liters/kg body weight normalized both cardiovascular and respiratory parameters . El-Shafey and Ezzat (1994) studied the effect of praziquantel on the acid-base status of blood of the rat, *Rattus norvigecus* after 24,48, 72, 96 and 168 hours of administration. The results showed that the drug caused deterioration in the blood acid- base status at the four days after the drug administration. Then it may be compensated and began to be normal after one week. El-Shafey (1994) reported that the praziquantel caused deterioration of both arterial and venous PO_2 and PCO_2 at four days after administration and then began returning to the normal values after one week, the oxygen loading, oxygen affinity and P_{50} of blood were also disturbed, but became close to normal after one week of the drug administration.

Abdel- Raheem *et al.* (1986d) studied the effect of brodifacoum and diphacinone on the lipid metabolism in rats, and found that the total content of lipids in brain, liver and Kidney declined with intoxication with LD_{50} of the two compounds except brain of rats treated with brodifacoum which manifested a moderate increase. The LD_{50} of rodenticides brodifacoum and diphacinone in rats induced increased GPT and GOT activities in brain and Kidney while liver exhibited reductions in the activity of the two enzymes. The same dose of both rodenticides increased activity of alkaline phosphatase in brain and liver while opposite effects occurred in kidney (Abdel- Raheem *et al* ., 1986 e). Ashry *et al.* (1987) reported that treatment of rat with three different doses of rodenticide warfarin (0.5, 1 and 2 mg/kg) led to a highly significant increase in the blood glucose level after 24 hours, thereafter this increase disappeared gradually till 45 days.

Abdel-Raheem *et al.*(1986 a) recorded that oral administration of two anticoagulant rodenticides (Warfarin and Racumin) induced declines in erythrocyte count, hemoglobin content and haematocrit value in rat intoxicated with LD_{50} of both compound , on the contrary, the leukocyte count markedly increased during the same treatments. Blood glucose indicates hyperglycemia in