

ملاحظات:



**STUDIES ON THE EFFECT OF CERTAIN PHOTSENSITIZERS ON
BIOLOGICAL, BIOCHEMICAL AND HISTOLOGICAL
PROPERTIES OF BULINUS TRUNCATUS SNAILS**

Submitted By

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B. Sc., Botany, Faculty of Science, Al-Azhar University (Girls Branch); (1996)
M.SC In Plant Physiology, Botany and Microbiology Department,
Faculty of Science, Al-Azhar University (Girls Branch); 2003

**A Thesis Submitted in Partial Fulfillment
Of
The Requirement for the Doctor philosophy Degree
In
Environmental Sciences**

**Department of Environmental Basic Sciences
Faculty of Graduate Studies and Environmental Research
Ain Shams University**

2022

APPROVAL SHEET

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ABSTRACT

This study evaluates the photosensitization technique for controlling the snail intermediate hosts of schistosomiasis. So, carbamide perhydrate along with copper and magnesium chlorophyllin (Cu-chl and Mg-chl) were bioassayed against *Bulinus truncatus* snails; the intermediate host of *Schistosoma haematobium*. The results indicated that LC₅₀ values of carbamide perhydrate, Cu-chl and Mg-chl were 91.73, 571.4 and 395.1 ppm, respectively. In addition, the sublethal concentrations of these agents induced significant deleterious changes in snails' fecundity and reproduction rate, sex hormones (progesterone, testosterone and 17- β estradiol), the activities of transaminases AST, ALT and alkaline phosphatase (AKP) enzymes, as well as the concentrations of total protein, albumin and globulin. Moreover, histopathological damages were observed in the tissues and cells of the digestive and hermaphrodite glands of treated snails. Also, these agents significantly reduced the infection of *B. truncatus* snails with *S. haematobium* miracidia and the production of cercariae from infected snails which have a negative reflection on the transmission of this parasite. Hence, these agents should be considered as a new technique for controlling this parasitic disease.

CONTENTS

ABSTRACT

LIST OF TABLES II

LIST OF FIGURES IV

LIST OF PLATES VI

LIST OF ABBREVIATIONS VII

INTRODUCTION 1

REVIEW OF LITERATURE 5

MATERIALS AND METHODS 26

RESULTS 40

DISCUSSION 102

SUMMARY 115

REFERENCES 120

ARABIC SUMMARY..... 1

LIST OF TABLES

Table	Subjects	Page
1	Molluscicidal activity of copper chlorophyllin (Cu-chl), magnesium chlorophyllin (Mg-chl) and carbamide perhydrate against <i>B. truncatus</i> snails.	41
2	survival rate (%) of <i>Bulinus truncatus</i> snails at light exposure periods post different periods of dark incubation with copper and magnesium chlorophyllin.	43
3	Survivorship (Lx) and fecundity (Mx) of <i>Bulinus truncatus</i> snails treated with sublethal concentrations of Carbamide perhydrate.	49
4	survivorship (Lx) and fecundity (Mx) of <i>Bulinus truncatus</i> snails incubated with copper chlorophyllin (Cu-chl) for 6 hours then exposed to light for 3 hours.	55
5	Survivorship (Lx) and fecundity (Mx) of <i>Bulinus truncatus</i> snails incubated with Magnisum chlorophyllin (Mg-chl) for 6 hours then exposed to light for 3 hours	60
6	Effect of carbamide perhydrate on biochemical parameters in the tissues of <i>Bulinus</i>	65
7	Effect of photosenthetizers (Cu-chl & Mg-chl) on some biochemical parameters in the tissues of <i>Bulinus truncates</i> snail's intermediate host of <i>schistsoma haematobium</i> .	69
8	Effect of Carbamide perhydrate on steroid sex hormones in tissues of <i>Bulinus truncatus</i> snails (Mean $\pm$ S.D.).	76

Table	Subjects	Page
9	Effect of Copper chlorophyllin (Cu-chl) on steroid sex hormones in tissues of <i>Bulinus truncatus</i> snails (Mean $\pm$ S.D.).	79
10	Effect of Magnesium chlorophyllin (Mg-chl) on steroid sex hormones in tissues of <i>Bulinus truncatus</i> snails (Mean $\pm$ S.D.).	82
11	Survival rate at 1 st shedding, infection rate, prepatent period, duration of shedding, life span and cercarial production from <i>Bulinus truncatus</i> snails exposed to carbamide perhydrate for 24 hours post 7 and 21 days of their exposure to <i>Schistosoma haematobium</i> miracidia.	95
12	Survival rate at 1st shedding, infection rate, prepatent period, duration of shedding, life span and cercarial production from <i>Bulinus truncatus</i> snails incubated with Cu-chl for 6 hours followed by exposure to light (desk lamp 100 W / 15 cm height) post 7 and 21 days of their exposure to <i>Schistosoma haematobium</i> miracidia.	98
13	Survival rate at 1st shedding, infection rate, prepatent period, duration of shedding, life span and cercarial production from <i>Bulinus truncatus</i> snails incubated with Mg-chl for 6 hours followed by exposure to light (desk lamp 100 W/15 cm height) post 7 and 21 days of their exposure to <i>Schistosoma haematobium</i> miracidia.	99

LIST OF FIGURES

Figures		Page
1	Survival rate (%) of <i>Bulinus truncatus</i> snails incubated with Mg-chl(A,C,E) and Cu-chl(B,D,F) followed by light exposure periods: A & B one hour, C& D 3 hours and E & F 6 hours.	45
2	Reproductive rate (R_0 , A), survivorship (L_x , B) and fecundity (M_x , C) of <i>B. truncatus</i> snails treated with sublethal concentrations of carbamide perhydrate	51
3	Reproductive rate (R_0 , A) survivorship (L_x , B) and fecundity (M_x , C) of <i>B. truncatus</i> snails treated with copper chlorophyllin (Cu-chl)	57
4	Reproductive rate (R_0 , A) survivorship (L_x , B) and fecundity (M_x , C) of <i>B. truncatus</i> snails treated with magnesium chlorophyllin (Mg-chl)	62
5	Effect of carbamide perhydrate on (A) total protein, albumin and globulin, (B) activity of AST, ALT and AKP enzymes in tissue homogenate of <i>Bulinus truncatus</i> snails.	66
6	Effect of copper chlorophyllin on: A- total protein and globulin, B albumin and C- activity of AST, ALT &ALP in tissue homogenate of <i>Bulinus truncatus</i> snails	70

7	Effect of magnesium chlorophyllin on: A-total protein and globulin, B- albumin and C-activity of AST, ALT & ALP in tissue homogenate of <i>Bulinus truncatus</i> snails.	72
8	Effect of carbamide perhydrate on: A-progesterone, testosterone and B- 17 β -estradiol hormones in tissue homogenate of <i>Bulinus truncatus</i> snails.	77
9	Effect of copper chlorophyllin on: A-progesterone, testosterone and B- 17 β -estradiol hormones in tissue homogenate of <i>Bulinus truncatus</i> snails	80
10	Effect of magnesium chlorophyllin on: A-progesterone, testosterone and B- 17 β -estradiol hormones in tissue homogenate of <i>Bulinus truncatus</i> snails.	83
11	Effect of carbamide perhydrate on survival rate at 1 st shedding. Infection rate (A), prepatent period, duration of shedding (B) and cercarial production (C) of <i>Bulinus truncatus</i> snails exposed to <i>Schistosoma haematobium</i> miracidia.	96
12	Effect of Cu-chl and Mg-chl on survival rate at 1 st shedding, infection rate (A), prepatent period, duration of shedding (B) and cercarial production (C) of <i>Bulinus truncatus</i> snails exposed to <i>Schistosoma haematobium</i> miracidia.	100

LIST OF PLATES

Pales		Page
1	Light photomicrographs showing transverse sections in the digestive gland of <i>Bulinus truncatus</i> snails stained with E & H (x 400):	86
2	Light photomicrographs showing transvers sections in the hermaphrodite gland of <i>Bulinus truncatus</i> snails stained with E & H (x400):	89

ABBREVIATIONS

$\Sigma(L_x M_x)$	: Summation of L_x and M_x
AKP	: Alkaline phosphatase
Alt	: Alanine aminotransferase
AST	: Aspartate aminotransferase
Cu-chl	: Copper chlorophyllin
L_C	: Lethal concentration
L_x	: Survivorship
Mg-chl	: magnesium chlorophyllin
M_x	: No. of eggs/ snail
ng/dl	: nanogram/deciliter
ng/ml	: nanogram/ milliliter
pg/ml	: pictogram/milliliter
Ppm	: part per million
R_0	: Net reproductive rate
Ug	: International unit/ gram

INTRODUCTION

Schistosomiasis is one of the public health and socioeconomic problems in several developing countries (Sayed *et al.*, 2008 & WHO 2013). It is a parasitic disease of poverty that leads to ill-health. Human infection occurs through contact with fresh water infested with the infective stage of the parasite (cercariae) during agricultural, domestic, occupational and recreational activities.

In Egypt, schistosomiasis epidemiological survey indicated *Schistosoma heamatobium* to be endemic in upper Egypt with a prevalence rate of about 7.8%, while *S. mansoni* is endemic in lower Egypt with around 36.4% prevalence rate (Elbaz & Esmat, 2013). Also, a recent study on mapping of *S. mansoni* prevalence in the Nile Delta, Egypt using the circulating cathodic antigen urine assay (urine- CCA) revealed that the overall rate of this parasite in the 5 tested governorates was 10.7% (4.7 % to 17.6 %) (Haggag *et al.*, 2017).

It was stated that the prevalence of schistosomiasis is increased as a result of creating new breeding sites for the snail intermediate hosts of the parasite by the construction of dams and introducing irrigation canals and drains for agricultural and domestic practices (Ali, 2011).