BIOCHEMICAL AND TOXICITY STUDIES ON THE EFFECT OF CARBOFURAN AND ITS FORMULATION ON METABOLISM IN EXPERIMENTAL ANIMALS

By

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B.Sc. Agric. Sci. (Biochemistry), Fac. Agric., Cairo Univ., 1998
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Title of Thesis: Biochemical and Toxicity Studies on the Effect of Carbofuran and its Formulation on Metabolism in Experimental Animals
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ABSTRACT

The present study was carried out to investigate the toxicity of carbofuran and its formulations administered daily at 15 and 30 ppm through drinking water for 90 consecutive days on male albino rats, carbofuran as technical type and two formulations furadan and furan containing the same active ingredients. The spermatozoa examinations, hormones assay, enzyme related fertility and histopathological examinations were carried out. Moreover, the weight of testis and accessory glands were determined. The antioxidant defense system status was examined by determining the activity of the following: glutathione-s-transferase (GST), reduced glutathione (GSH) and superoxide dismutase (SOD) beside the level of triglyceride and cholesterol. The results revealed that a decrease in sperm motility and sperm concentration after 90 days of treatment at the two tested concentrations for furan and carbofuran. While, after 60 days of treatment with furadan and furan caused a decrease of pregnancy rate and litter size per female available at the two concenteration. Moreover, a reduction in weight of testis was noted. On the other hand significant increases were observed in seminal vesicle. Moreover, carbofuran and other formulation caused a decrease of total acid phosphatase activity and fructosamine contant, while increase in lactatedehydrogenase enzyme activity (LDH) which related to fertility. Moreover, did not alter of testosterone in all treatments. Also, carbofuran adjuvant induced significant decrease of GSH, SOD and cholesterol levels but GST activity and total triglyceride increased after treatment. The data revealed that, intoxicated effect of carbofuran, furadan and furan at15&30 ppm on Plasma cholinestersae activity. While, caused a significant decrease in ChE activity after 90days at 30ppm by carbofuran only. Moreover, a reduction in glucose level and total protein for carbofuran and furadan after 60 days. On other hand significant increases were observed in albumin for furan only after 90 days. Also, histopathological changes in testis was noted after treated with furan only.

Key words: carbofuran, spermatozoa examinations , fertility, antioxidant enzyme, lipid profile

DEDICATION

I dedicate this work to whom my heart felt thanks; to my family and my son ***Marawan*** *for their patience and help, as well as to my parents and my closed friends for all the support they lovely offered along the period of my post graduation.*

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CONTENTS

CONTANTS

LIST OF ABBREVIATION

Ach-E	Acetyl cholinesterase
ACP	Acid phosphatase
ALB	Albumine
CDNB	1 – chloro2,4- dinitrobenzene
ChE	Cholinesterase
DTNB	5, 5 dithiobis (2-nitrobenzoic acid)
EDTA	Ethylenediamine tetracetic acid
FSH	Follicle stimulating hormone
GR	Glutathione reductase
GSH	Glutatione reductase
GSH-PX	Glutathione peroxidase
GSSG	Oxidized glutathione
GST	Glutathione - S – transferase
Hb	Hemoglobin
LD_{50}	Median lethal dose
LH	Latinizing hormone
LDH	Lactatdehydrogenase
LP	Lipid peroxidation
LPO	Lipid peroxidase enzyme
MCH	Mean corpuscular hemoglobin

MCHC	Mean corpuscular hemoglobin concentration
MCV	Mean corpuscular volume
NBT	Nitro blue tetrazolium
OFR	Oxygen free radical
PCV	Packed cell volume
PO	Peroxidase enzyme
RBCs	Red blood cells
SDH	Sorbital dehydrogenase
SOD	Superoxide dismutase
TBARS	Thiobarbeturic acid
TG	Triglyceride
TP	Total protein
WBCs	white blood cells

LIST OF FIGURES