بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

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شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

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MONA MAGHRABY

THE EFFECT OF SOME PLANT OILS ON ORGANS DYSFUNCTION INDUCED BY EXPOSURE TO CEMENT DUST IN RATS

Submitted By

Marwa Ashry Hanfy Mahmoud

B.Sc. of Biochemistry and Nutrition, Faculty of Women for Arts, Science & Education,
Ain Shams University, 2002

A Thesis Submitted in Partial Fulfillment
Of
The Requirement for the Master Degree
In
Environmental Sciences

Department of Environmental Basic Sciences
Institute of Environmental Studies and Research
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2021

APPROVAL SHEET

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Marwa Ashry Hanfy
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ABSTRACT

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Edible oils, preferably of plant origin are rich sources of fatty acids and other lipophilic antioxidants that assist in the prevention and/ or treatment of some diseases. This study aimed to investigate the possible protective effects of some plant oils on cement induced liver toxicity and kidney dysfunction in rats. Forty Sprague Dawley rats (20 male + 20 female) were divided into five groups (8 rats/group, four males and four females). Group1: negative control, was fed on a basal diet; group II: positive control, was fed on a basal diet contains cement (1.5 g/Kg); groups III, IV, V were fed on basal diet contain cement (1.5g/Kg) and 10 % of one the tested oils (coconut oil, or flaxseed oil or olive oil, respectively, instead of corn oil) the experiment continued for four weeks. RESULTS: Oral cement exposure resulted in a significant elevation in serum activity of alanine transaminase (ALT), Aspartate transaminase (AST), and lactate dehydrogenase (LDH) in addition to significant high levels of serum urea and creatinine. This was accompanied by a significant rise in the hepatic level of malondialdehyde (MDA). Plant oils reinstated most of the altered measured parameters. Histological examination of the liver, kidney, lungs, and brain revealed that cement exposure resulted in fibrosis in the portal triad, and focal hepatic hemorrhage, hydropic degeneration of epithelial lining renal tubules, interstitial pneumonia, and necrosis of neurons and neuronophagia. While the histological examinations in the tested oils groups revealed improvement in these organs. It can be concluded that supplementation of the diet with coconut oil, flaxseed oil, or olive oil was effective in modulating some aspects of cement induced toxicity. This efficacy may be related to the fatty acids and/ or polyphenols found in these

oils. The study indicates that coconut oil, flaxseed oil, and olive oil can be used as nutraceutical agents against cement induced toxicity.

Keywords: Coconut oil, Flaxseed oil, Olive oil, Cement, Rats

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List of Abbreviations

Abbreviation	Name
ACC	Acetyl-CoA carboxylase
ALA	Alpha-linolenic acid
ALT	Alanine aminotransferase
ARA	Arachidonic acid
AST	Aspartate aminotransferase
BWG	Body weight gain
CAT	Catalase
COPD	Chronic obstructive pulmonary disease
CRP	C-reactive protein
DHA	Docosahexaenoic acid
EPA	Eicosatetraenoic acid
FER	Feed efficiency ratio
FI	Feed intake
GLDH	Glutamate dehydrogenase
GST	Glutathione S-transferase
HDL	High-density lipoprotein
HT	Hydroxytyrosol
IL-1	Interleukin-1
IL-6	Interleukin-6
LA	Lauric acid
LCFA	Long-chain fatty acids
LDH	Lactate dehydrogenase
LDL	low-density lipoprotein
MCFAs	Medium-chain fatty acids
MCT	Medium-chain triglyceride
MDA	Malondialdehyde
NFkB	Nuclear factor kB
NMSC	Non-melanoma skin cancer
Nrf1	Nuclear respiratory factor 1
PGE2	Prostaglandin E2
PUFAs	Polyunsaturated fatty acids