

**Evaluation of active ingredients and biological
activities of *Euphorbia dendroides* L.**

**A thesis submitted for
Doctor of Philosophy of science in Biochemistry**

By

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وعملا متقبلا

Declaration

*This thesis has not been submitted to
this or any other university*

Fatma Fathy El- Gneady

Dedication

We must love them both, whose opinions we share and whose opinions we reject. For both have labored in the search for truth and have helped us in the finding of it. Finally, Success comes when passion and talent are combined with a heavy dose of perseverance and a bit of luck.

Fatma Fathy El- Gneady

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Abstract

Euphorbia dendroides belongs to family Euphorbiaceae in the past was used in full strength to burn warts and verrucas and very diluted as a strong purgative or in even lighter concentration as an emetic. Powder from the roots was used to cure rheumatic pains.

The aim of this study is to evaluate the Hepatoprotective activity against hepatotoxicity induced by CCl_4 , cytotoxic, antimicrobial activities of *Euphorbia dendroides* extracts(ethanolic, chloroform, butanol). This effects are attributed to the isolated compounds from the extract.

This aim was achieved through estimation of some biochemical parameters(liver function tests, oxidative stress biomarkers, proinflammatory markers) and histopathological examination of liver tissues from all groups. In addition to determination of IC_{50} of extracts against different human cancer cell lines (HEP-G2, MCF-7, HCT-116, HELA) and MIC of all extracts against diferrent strains of bacteria and fungi.

Conclusion: Our results indicated that *Euphorbia dendroides* chloroform extract has a hepatoprotective activity against acute hepatotoxicity induced by CCl_4 in rats . On the other hand, all *Euphorbia dendroides* extracts have cytotoxic and antimicrobial activities. Isolation and identification of active ingredients from chloroform extract gave 3 main compounds which were identified by means of $^1\text{H-NMR}$ as Ursodeoxycholic acid, Genistein and 17-(2-hydroxy-1,5-dimethyl-hex-4-enyl)-4,4,10,13,14-pentamethyl-2,3,4,5,6,7,10,1

Key words: *Euphorbia dendroides*, hepatoprotective, cytotoxic, antimicrobial.

Contents

Contents	Page
Abbreviations.	
List of figures.	
List of tables.	
Abstract.	
Introduction.	1
Aim of the work.	6
Review of literature.	7
• Description	8
• Uses of <i>Euphorbia</i> in folk medicine	12
• Chemical constituents of <i>Euphorbia</i>	14
• Hepatoprotective and Antioxidant Activities	23
• Cytotoxic Activity	39
• Antimicrobial Activity	43
Materials and Methods	46
Results	93
Discussion.	197
Summary.	210
References.	217
الملخص العربى	

ABBREVIATIONS

13-OD	:	13-Oxyingenol dodecanoate
¹ H-NMR	:	Proton nuclear magnetic resonance
ALT	:	Alanine aminotransferase
AST	:	Aspartate aminotransferase
ATP	:	Adenosine triphosphate
BHT	:	Butylated hydroxylated toluene
CAT	:	Catalase
CCl ₄	:	Carbon tetrachloride
DPPH	:	1,1'-diphenyl- 2-picryl -hydrazyl
E	:	Euphorbia
EGF	:	Epidermal growth factor
ELISA	:	Enzyme-linked immunesorbant assay
G1	:	Growth 1 phase
GC-MS	:	Gas chromatography coupled mass
Gp130	:	Type I transmembrane glycoprotein 130
Gp80	:	type I transmembrane glycoprotein 80
GSH	:	Reduced glutathione
GSH-Px	:	Glutathione peroxidase
H ₂ O ₂	:	Hydrogen peroxide
HCT-116	:	Human colon carcinoma cell line
HELA	:	<u>Henrietta Lacks</u> , Cervical carcinoma cell line
HEP-G2	:	Liver carcinoma cell line

HPLC	:	High performance liquid chromatography
HSC	:	Hepatic stellate cells
ICAM-1	:	Intracellular adhesion molecule
IL-6	:	Interleukin- 6
IL-6R α	:	Non signaling interleukin-6 receptor
IRF-1	:	IFN-Regulating factor1
LDL	:	Low density lipoprotein
LDL-c	:	Low-density lipoprotein-cholesterol
LFA-1	:	Lymphocyte function associated antigen-1
LO	:	Lipoxygenases
LPS	:	lipopolysaccharide
MCF-7	:	Breast cancer cell line
MI	:	Myocardial infarction
MiaPaCa-2	:	Pancreatic cancer cell line
Mn-SOD	:	Manganese superoxide dismutase
MPO	:	Myeloperoxidase
NADPH	:	Nicotinamide adenine dinucleotide phosphate
NEFA	:	Non-esterified fatty acids
NF- κ B	:	Nuclear factor κ B
NO $\cdot$	:	Nitric oxide
NO ₂	:	Nitrite
NOS	:	Nitric oxide synthase
NOX	:	The NADPH oxidase
Nrf2	:	Nuclear factor-erythroid 2-related factor 2
NSTEMI	:	Non-ST elevation myocardial infarction

OH [•]	:	Hydroxyl radical
ONOO ⁻	:	Peroxynitrite anion
Ox-LDL	:	Oxidized low density lipoprotein
pl.GSHPx	:	Plasma glutathione peroxidase
RNS	:	Reactive nitrogen species
ROS	:	Reactive oxygen species
SOC-3	:	Suppressor of cytokine signaling -3
SOCS	:	Suppressor of cytokine signaling
SOD	:	Superoxide dismutase
STAT3	:	Signal transducer and activator for transcription
TGF- α	:	Tumor growth factor - α
TNF	:	Tumor necrosis factor
TNFR1	:	Tumor necrosis factor receptor1
TNFR2	:	Tumor necrosis factor receptor2
TNF- α	:	Tumor necrosis factor- α
VEGF	:	Vascular endothelial growth factor
WHO	:	World health organization

List of figures

Fig.		Page
1	<i>Euphorbia dendroides</i> in its natural habitat.	5
2	<i>Euphorbia dendroides</i> .	11
3	Structure of diterpenoides produced by plants of the Euphorbiaceae.	15
4	Scheme depicting selected sources of ROS.	28
5	Regulation and function of TNF- α and IL-6 in the regenerating liver.	36
6	Standard calibration curve of TNF- α .	72
7	Standard calibration curve of IL-6.	77
8	Percentage change of ALT & AST in all groups vs CCl ₄ .	96
9	Percentage change of ALP & T-Bill in all groups vs CCl ₄ .	99
10	Mean $\pm$ SE of ALT,AST&ALP in all groups.	100
11	Percentage change of T. Prot & Albumin in all groups vs CCl ₄ .	103
12	Mean $\pm$ SE of T. Prot & Albumin in all groups.	104
13	Percentage change of SOD & Catalase in all groups vs CCl ₄ .	107
14	Percentage change of GPx & MDA in all groups vs CCl ₄ .	110
15	Mean $\pm$ SE of SOD, Catalase, GPx & MDA in all groups.	111
16	Percentage change of TNF- α & IL-6 in all groups vs CCl ₄ .	114
17	Mean $\pm$ SE TNF- α & IL-6 in all groups.	115
18	Receiver operating characteristic (ROC) curves displaying the accuracy of SOD, Catalase, GPx and MDA in Silymarin group vs CCl ₄ .	117
19	Receiver operating characteristic (ROC) curves	118

	displaying the accuracy of TNF- α and IL-6 in Silymarin group vs CCl ₄ .	
20	Receiver operating characteristic (ROC) curves displaying the accuracy of SOD, Catalase, GPx and MDA in Silymarin group vs CCl ₄ .	120
21	Receiver operating characteristic (ROC) curves displaying the accuracy of TNF- α and IL-6 in A250 group vs CCl ₄ .	121
22	Receiver operating characteristic (ROC) curves displaying the accuracy of SOD, Catalase, GPx and MDA in A500 group vs CCl ₄ .	123
23	Receiver operating characteristic (ROC) curves displaying the accuracy of TNF- α and IL-6 in A500 group vs CCl ₄ .	124
24	Receiver operating characteristic (ROC) curves displaying the accuracy of SOD, Catalase, GPx and MDA in B250 group vs CCl ₄ .	126
25	Receiver operating characteristic (ROC) curves displaying the accuracy of TNF- α and IL-6 in B250 group vs CCl ₄ .	127
26	Receiver operating characteristic (ROC) curves displaying the accuracy of SOD, Catalase, GPx and MDA in B500 group vs CCl ₄ .	129
27	Receiver operating characteristic (ROC) curves displaying the accuracy of TNF- α and IL-6 in B500 group vs CCl ₄ .	130
28	Receiver operating characteristic (ROC) curves displaying the accuracy of SOD, Catalase, GPx and MDA in C225 group vs CCl ₄ .	132
29	Receiver operating characteristic (ROC) curves displaying the accuracy of TNF- α and IL-6 in C225 group vs CCl ₄ .	133
30	Receiver operating characteristic (ROC) curves	135

	displaying the accuracy of SOD, Catalase, GPx and MDA in C450 group vs CCl ₄ .	
31	Receiver operating characteristic (ROC) curves displaying the accuracy of TNF- α and IL-6 in C450 group vs CCl ₄ .	136
32	The correlation matrix of SOD with MDA in CCl ₄	137
33	The correlation matrix of TNF- α with different parameters in Silymarin	137
34	Correlation matrix of MDA with T.Prot in Sylimarín group	138
35	The correlation matrix of catalase with different parameters in A250 group.	139
36	The correlation matrix of GP _x and MDA with different parameters in A250 group.	140
37	The correlation matrix of SOD and TNF- α with different parameters in A250 group	141
38	The correlation matrix of MDA and IL-6 with different parameters in A250 group.	142
39	The correlation matrix of MDA ,IL-6 and T.Protein with different parameters in A500 group.	144
40	The correlation matrix of SOD with GP _x in A500 group.	145
41	The correlation matrix of different parameters in B250 group.	146
42	The correlation matrix of SOD and IL-6 with different parameters in B250 group.	147
43	The correlation matrix of catalase with different parameters in C225 group.	149

44	The correlation matrix of SOD with T. Bilirubin in C225 group.	150
45	The correlation matrix of GPx with diferrent parameters in C450 group.	151
46	The correlation matrix of il-6 with Catalase in C450 group.	151
47	The correlation matrix of SOD with Total protein in C450 group.	151
48	Liver tissue in normal group.	155
49	Liver tissue inCCl ₄ group.	155
50	Liver tissue in silymarin group.	156
51	Liver tissue in A250 group.	156
52	Liver tissue in A500 group.	157
53	Liver tissue in B250 group.	157
54	Liver tissue in B500 group.	158
55	Liver tissue in C225 group.	158
56	Liver tissue in C450 group.	159
57	Effect of <i>Euphorbia</i> A extract on HepG ₂ cells	161
58	Effect of <i>Euphorbia</i> B extract on HepG ₂ cells	161
59	Effect of <i>Euphorbia</i> C extract on HepG ₂ cells	161
60	Effect of <i>Euphorbia</i> A extracts on MCF-7 cells	162
61	Effect of <i>Euphorbia</i> B extracts on MCF-7 cells	162
62	Effect of <i>Euphorbia</i> C extracts on MCF-7 cells	162
63	Effect of <i>Euphorbia</i> A extracts on HCT-116 cells	163
64	Effect of <i>Euphorbia</i> B extracts on HCT-116 cells	163
65	Effect of <i>Euphorbia</i> C extracts on HCT-116 cells	163
66	Effect of <i>Euphorbia</i> A extracts on Hela cells	164
67	Effect of <i>Euphorbia</i> B extracts on Hela cells	164
68	Effect of <i>Euphorbia</i> C extracts on Hela cells	164
69	HPLC Chromatogram of ethanolic extract	172