



Ain Shams University
Faculty of Women for
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Zoology Department

The Protective Effect of *Moringa oleifera* Extract and Hepatoprotective Remedy Against Sodium Valproate-induced Liver Toxicity in Adult Rats.

A thesis

Submitted in Partial Fulfillment of the Requirements for the
Degree of Ph.D. of Science in physiology
By

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قَالَ رَبِّ اشْرَحْ لِي صَدْرِي وَيَسِّرْ لِي أَمْرِي

وَاحْلُلْ عُقْدَةً مِّنْ لِّسَانِي يَفْقَهُوا قَوْلِي

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Abstract

Purpose: This work has been carried out to investigate possible ameliorative effect of *Moringa oleifera* leaves extract against sodium valproate (VPA) induced-liver injury in male albino rats. Mepacure (MEPA) was used as reference hepato-protective drug.

Methods: Male albino rats were divided into five groups of 24 rats in each group. Group1 (Control): untreated animals served as control. Group 2 (VPA): hepatic toxicity was induced by the administration of VPA (500mg/kg b.wt.) orally once daily for 6 weeks. Group 3 (VPA+MO): rats received VPA along with *Moringa oleifera* leaves extract (500 mg/kg b.wt.) orally once daily for 6 weeks. Group 4(VPA + MEPA): rats received VPA along with mepacure (21.6mg/ kg b.wt.) orally once daily for 6 weeks. Group 5 (VPA+MO+MEPA): rats received VPA along with *Moringa* and mepacure orally once daily for 6 weeks.

Results: There was significant ($P<0.05$) increase in serum levels of liver marker enzymes, alanine aminotransferase (ALT), aspartate aminotransferase (AST), and gama glutamyltransferase (GGT) in the VPA treated group compared to the normal control. Also, an elevation in the pro-inflammatory cytokines (TNF- α) level in VPA treated group. While, serum total protein levels significantly decreased. Sodium valproate induced oxidative stress in terms of increased of liver malondialdehyde (MDA), nitric oxide (NO) and oxidized

glutathione (GSSG) contents and decreased glutathione (GSH) content. Furthermore, VPA provoked apoptotic response through increasing gene expression of pro-apoptotic (Bax) and decreasing gene expression of anti-apoptotic (Bcl2) in liver tissue. Moringa attenuated the serum activities of liver markers enzymes of ALT, AST and GGT. Also, it displayed significant ($P < 0.05$) reduction in GSSG, MDA and NO level and caused a significant increase in total protein and GSH contents when statistically compared with VPA treated group. MO administration suppressed the elevation in the gene expression of pro-apoptotic Bax and significant increase in the anti-apoptotic gene Bcl2, restored the normal redox status and inhibited the inflammatory factor. Also, Histopathological examination confirmed the ameliorative effect for the Moringa leaves extract and Mepacure drug against VPA induced liver injury.

Conclusion: This study showed that oral administration of moringa leaves extract and nutraceutical drug reduced serum enzymes biomarker activities, restored normal level of liver redox status, reduced inflammation and regulated liver gene expression in sodium valproate-induced liver injury in adult rats.

Key words: Liver toxicity, sodium valproate, *Moringa oleifera*, oxidative stress, gene expression, rats.

List of Contents

INTRODUCTION...	1
AIM OF WORK	4
REVIEW OF LITERATURE	5
The Liver	5
Functions of the liver	8
Hepatic drug metabolism	10
Drug induced liver injury (DILI)	11
Sodium valproate (VPA)	12
Liver metabolism of valproic acid	20
Oxidative stress in liver injury	23
Valproate and oxidative stress	26
Inflammatory cytokines (Tumor Necrosis Factor- α (TNF- α))	29
The gene	31
Gene expression	33
Expression of Bcl2 and Bax genes	34
Medicinal Plants	38
Moringa oleifera	40
Chemical constituents of moringa	39
The medicinal and pharmacological effects of <i>Moringa oleifera</i>	51
Mepacure drug	59
Silymarin	60
Dimethyl dimethoxy biphenyl dicarboxylate (DDB)	65
MATERIALS AND METHODS	70
1- Materials	70
1.1. Animals and experimental conditions	70
1.2. Moringa oleifera leaves	71
1.3. Mepacure capsules	71
1.4. Sodium valproate	72
1.5. Experimental design	72
1.6. Sample collection	73
2-Methods	74
2.1. Biochemical analysis	74

2.1.1- Determination of serum alanine transaminase activity (ALT)	74
2.1.2- Determination of serum aspartate transaminase activity (AST)	75
2.1.3- Determination of serum Gamma-Glutamyl transferase (γ -GT)	76
2.1.4 - Determination of Serum Total Protein Level	77
2.1.5- Determination of Pro-inflammatory cytokines (TNF- α)	77
2.2. Oxidative stress and antioxidant parameters	79
2.2.1- Determination of hepatic GSH and GSSG by HPLC	79
2.2.2-Determination of hepatic malondialdehyde (MDA)	80
2.2.3- Determination of hepatic Nitric oxide (NO)	82
2.3. Determination of Gene expression (Bax and Bcl2)	83
2.3.1- RNA Extraction	83
2.3.2-cDNA synthesis	85
2.4. Histopathological examination	90
2.5. Statistical analysis	91
RESULTS	92
DISCUSSION	146
SUMMARY AND CONCLUSION	179
REFERENCES	186

List of Tables

Table (1):Nutritive value of <i>M. oleifera</i>	49
Table (2): Phytochemical constituents isolated from <i>Moringa oleifera</i> Lam	50
Table (3): The cDNA master mix	86
Table (4): Primer sequence of the studied genes	88
Table (5): Reagents and volumes added in master mix for Q-PCR	89
Table (6): Running condition for RT-PCR.	89
Table (7): Effect of <i>Moringa oleifera</i> (MO, 500mg/kg) and /or Mepacure (MEPA, 21.6mg/ kg) on serum level of ALT activity (U/L) in Sodium Valproate (VPA, 500mg/kg) treated rats once daily for 6 weeks.	94
Table (8): Effect of <i>Moringa oleifera</i> (MO, 500mg/kg) and /or Mepacure (MEPA, 21.6mg/ kg) on serum level of AST activity(U/L) in Sodium Valproate (VPA, 500mg/kg)-treated rats once daily for 6 weeks.	97
Table (9): Effect of <i>Moringa oleifera</i> (MO, 500mg/kg) and /or Mepacure (MEPA, 21.6mg/ kg) on serum level of GGT activity (U/L) in Sodium Valproate (VPA, 500mg/kg)- treated rats once daily for 6 weeks.	100
Table (10): Effect of <i>Moringa oleifera</i> (MO, 500mg/kg), and /or Mepacure (MEPA, 21.6mg/ kg) on serum level of Total Protein (g/dl) in Sodium Valproate (VPA, 500mg/kg)- treated rats once daily for 6 weeks.	103
Table (11): Effect of <i>Moringa oleifera</i> (MO, 500mg/kg),	106