Ain Shams University
Faculty of Women for
Arts, Science and Education
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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قَالَ رَبِّ اشْرَحْ لِي صَدْرِي وَيَسِّرْ لِي أَمْرِي

وَاحْلُلْ عُقْدَةً مِّن 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 malondialdhyde (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 activites, 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.

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