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15th International Congress of Laboratory and Clinic

25-28 January, 2024

Children's Medical Center Hospital, Tehran, Iran.





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Venue:
Tehran University of Medical Sciences, Tehran, Iran.
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In the Name of God

Book of Abstracts

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Section: Biochemistry

Presentation Type: Poster

Abstract Type: Original Research

Code of Abstract: PBI-10

Study of the protective effect of *Humulus lupulus* on carbon tetrachloride- induced testicular damage in rats

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Abstract

Background and Aim: The testis is an organ in all male Mammals upon which the survival of the human species depends. Some drugs, chemicals, and xenobiotic toxicants can damage to the testicular organ due to their oxidative degradation. In this study, the effects of the protective compounds of the extract of *Humulus lupulus* (hop) on testicular damage induced by carbon tetrachloride (CCl₄) in adult male rats were investigated.

Methods: First, 24 male Wistar rats were divided into 4 groups of 6. Groups 1 and 2 received physiological serum for two weeks, while groups 3 and 4 received 100 and 200 mg/kg hop extract daily for two weeks, respectively. To induce testicular damage, except for group 1, all other groups received a mixture of carbon tetrachloride and olive oil at a dose of 1 ml/kg body weight on the fourteenth day. 48 hours after the injection, the animals were anesthetized and samples were taken.

Results: The results showed that hop extract consumption increases the total antioxidant capacity of testicular tissue and reduces malondialdehyde in testicular tissue of rats exposed to carbon tetrachloride ($p < 0.001$).

Conclusion: *Humulus lupulus* extract can protect testicular tissue against oxidative stress caused by carbon tetrachloride metabolism.

Keywords: Testicular damage; Carbon tetrachloride; *Humulus lupulus*; Oxidative stress; Antioxidant.





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The protective effects of *Humulus Lupulus* (Hop) extract on carbon tetrachloride- induced myocardium injury in rats

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Abstract

Background and Aim: Cardiovascular diseases are the most common causes of death and disability in the world. The aim of this study was to investigate the protective effects of *Humulus lupulus* (hop) on myocardium injury induced by carbon tetrachloride (CCl₄) in rats.

Methods: In this study, 24 male Wistar rats (200-250 g) randomly were categorized into four groups (n = 6). Groups 1 and 2 received physiologic serum for two weeks, while groups 3 and 4 received 100 and 200 mg/kg hop extract daily for two weeks, respectively. To induce heart damage, except for group 1, all other groups received a mixture of carbon tetrachloride and olive oil (1:1) at a dose of 1 ml/kg body weight on the 14th day. Forty - eight hours after the injection, the animals were anesthetized by intraperitoneal injection of ketamin and xylazin, and then the samples were taken.

Results: The results of this study showed that treatment with carbon tetrachloride significantly increased the level of MDA and decreased antioxidant capacity (P < 0.001). Consumption of hop extract significantly ameliorated these factors in comparison to the untreated group (P < 0.001).

Conclusion: The results of this study showed that hop extract can protect the heart against oxidant compounds and free radicals produced by carbon tetrachloride metabolism.

Keywords: *Humulus lupulus*; Carbon tetrachloride; Myocardium; Lipid peroxidation; Antioxidant





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Code of Abstract: PBi-13

Harnessing nature's power: feverfew as a promising herb in medicine

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Abstract

Autoimmune diseases, Cancers, and diabetes have emerged as the tenacious diseases of the current era due to lifestyle changes. With drastic breakthroughs of the 20th and 21st centuries in the area of medicine, herbs and traditional approaches have mostly been replaced with synthetic therapeutics. However, the medicinal potential of long - used herbs should not be overlooked. Feverfew (*Tanacetum parthenium*), originally used for the treatment of migraine and inflammation for centuries, is a traditional herbal remedy with broad geographical distribution and is rich in a large number of natural active products such as sesquiterpene lactones including parthenolide as well as flavonoid glycosides and pinenes. In this narrative review, we summarized the recent significant findings of the available valid literature regarding the relationship between the use of Feverfew and a wide range of pathological as well as physiological conditions extracted from scientific databases including Scopus, ScienceDirect, and Pubmed. Additional experiments have demonstrated some beneficial effects of Feverfew in treating autoimmune conditions, asthma, allergies, fever, tinnitus, dizziness, nausea, infertility, menstruation problems, and diabetic - induced neuropathy. Feverfew can inhibit oxidative stress - mediated tissue damage caused by various toxic chemicals such as carbon tetrachloride by increasing superoxide dismutase, glutathione peroxidase, catalase activity, improving total antioxidant capacity, lowering malondialdehyde levels, regulating p53 pathway, and inhibition of STAT3/ NF- κ B and Nrf2/ Keap1 pathways, inflammasome activation, as well as downregulation of lipopolysaccharide-mediated tumor necrosis factor- α (TNF- α), MCP-1, interleukin-6, interleukin-1B, prostaglandins, COX-2, and leukotrienes production. In addition, Feverfew displays anti - cancer properties by influencing cell proliferation rate as a result of its regulatory effects on nucleotide, lipid, and protein metabolism. The vast medicinal properties and safety of Feverfew necessitate further research to discover the exact mechanisms by which this herb displays its therapeutic effects.

Keywords: Feverfew; Oxidative stress; Cancer; Autoimmune diseases; inflammation



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MMP2 and MMP9: the inflammatory gatekeepers

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Abstract

Inflammatory processes are considered the essential hallmark of a broad range of pathological conditions. In the 21st century, lifestyle changes have laid the foundation for the emergence of a wide variety of acute as well as chronic diseases based on inflammation and inflammatory-related pathways. Matrix metalloproteinases (MMPs) are a key class of molecules primarily recruited for tissue repair and remodeling, embryonic development, and morphogenesis in the body via matrix degradation. However, alterations in this pathway can result in the emergence of diseases. In this narrative review, we summarized the recent significant findings of the available valid literature regarding the relationship between metalloproteinase 2 and 9 and inflammatory pathways and related diseases extracted from scientific databases including Scopus, ScienceDirect, and Pubmed. Recently, matrix metalloproteinases 2 and 9 have emerged as important regulatory molecules in inflammation-related pathophysiological processes such as oxidative stress. MMP9 has been found to be upregulated across an extensive range of cancers, while interestingly MMP2 is mostly found to be downregulated. MMP2 and MMP9 are also reported to be involved in the pathogenesis of autoimmune diseases, diabetes, as well as atherosclerosis. Many herbal extracts such as linalool and food supplementations including omega-3- fatty acid have been found to improve oxidative stress parameters by directly influencing the function of MMP2 and MMP9. Studying and understanding the exact mechanisms by which MMP2 and MMP9 exert their function can aid in the process of developing brand-new and novel therapeutic approaches. In this narrative review, we summarize the role of MMP2 and MMP9 in inflammation.

Keywords: Metalloproteinase 2; Metalloproteinase 9; inflammation; oxidative stress.

