CURRENT RESEARCH TOPICS IN PHARMACY:

Traditional Medicine Talks

May 26th, 2023

FIRST SESSION
11.00 AM-12.45 PM
Moderator:
Mehmet GÜMÜŞTAŞ

Welcome
Assoc.Prof. Betül OKUYAN

Bioorganic MgO nanoparticles attenuate oxidative stress and upregulate gene expressionto attenuate doxorubicin-induced cardiotoxicity
Prof. Atiar Rahman

Phytopharmaceuticals as aprotagonist approach for upsurging bioactivity of traditional medicines
Assist.Prof.Monika Dwivedi

Evaluation of *Withania somnifera* (Ashwagandha) in post-traumatic stress disorder induced neurobehavioral and biochemical markers : An experimental study
Dr. Sana Rehman

SECOND SESSION
13:00-14.45 PM
Moderator:
Ceyda EKENTOK ATICI

HPTLC: A tool for herbal drug discovery
Prof. Abhishek Gupta

Persian Traditional Medicine
Assist. Prof. Laleh Khodaie

Folk medicinal plants of Turkey : An overwiev
Assoc. Prof. Gizem Emre

Interactions of traditional and modern medicine in respiratory disorders : An Indian perspective
Prof. Arunabha Ray

THIRD SESSION
15.00-16.15 PM
Moderator:
Esra TATAR

Traditional use of medicinal plants in Albania, past and present
Prof. Vilma Papajani

Voltametric analysis of the antioxidative potential of medicinal plants traditionally used in North Macedonia
Assoc. Prof. Viktorija Maksimova

Biological activities of *Scolymus hispanicus L.*
Assist.Prof.Pervin Rayaman

CHAIR
Prof. Hatice Kübra ELÇİOĞLU
VICE CHAIRS
Prof. Levent KABASAKAL & Assoc. Prof. Esra TATAR

ORGANIZING & SCIENTIFIC COMMITTEE
Editorial Board of Journal of Research in Pharmacy
https://www.jrespharm.com/

JRP
Journal of Research in Pharmacy
An international open-access journal of pharmacy and pharmaceutical sciences
Formerly published as Marmara Pharmaceutical Journal

ONLINE SYMPOSIUM

CURRENT RESEARCH TOPICS IN PHARMACY:

Traditional Medicine Talks

May 26th, 2023

ORGANIZING & SCIENTIFIC COMMITTEE

Editorial Board of Journal of Research in Pharmacy

https://www.jrespharm.com/

JRP

Journal of Research in Pharmacy

An international open-access journal of pharmacy and pharmaceutical sciences

Formerly published as Marmara Pharmaceutical Journal

ONLINE SYMPOSIUM

BIOORGANIC MgO NANOPARTICLES ATTENUATE OXIDATIVE STRESS and UPREGULATE GENE EXPRESSION TO ATTENUATE DOXORUBICIN-INDUCED CARDIOTOXICITY

Md. Atiar RAHMAN[1,2,*], Fatema Yasmin NISA[1], Khalid Juhani RAFI[1], Srabonti SAHA[1]

[1]Department of Biochemistry and Molecular Biology, University of Chittagong, Chittagong, Bangladesh.
[2]School of Allied Health Sciences, Walailak University, Thailand.

atiar@cu.ac.bd or mdatiar.ra@wu.ac.th

*Corresponding and presenting author

Plant materials used in association with metal oxide nanoparticles are a viable alternative to chemical approaches. We studied the cardioprotective effects of the biosynthesized magnesium oxide nanoparticles (MgO-NPs) from the hydroalcoholic extracts of *Tamarindus indica* fruit pulp, seed, and pericarp. The synthesized nanoparticles were characterized with ultraviolet-visible spectroscopy (UV-Vis), X-ray diffraction (XRD), scanning electron microscopy (SEM) with energy-dispersive X-ray diffraction (EDX), and Fourier-transform infrared spectroscopy (FTIR). Total phenolic contents (TPC) and total flavonoid contents (TFC) were measured to detect the presence of phenol and flavonoid-like components in the MgO-NPs. The biogenic MgO-NPs (Pulp-MgONP, Seed-MgONP, and Pericarp-MgONP) were evaluated for their antioxidant potential using 2,2-diphenyl-1-picrylhydrazyl (DPPH), 2,2-azinobis-(3-ethylbenzothiazoline-6-sulfonate) (ABTS•+), and Nitric oxide (NO) scavenging assays, as well as the Ferric ion reducing antioxidant power (FRAP) assay. Additionally, Wistar albino rats were undertaken to measure the cardioprotective impact of biogenic MgO-NPs against Doxorubicin-induced cardiotoxicity. BHK-21 and Vero cell lines were incorporated for toxicity tests. Gene expression of cardiac tissue was studied to evaluate the effect of MgO-NPs in upregulations of cardiac genes. The UV–VIS spectroscopy of the biogenic MgO-NPs verified the synthesis of MgO-NPs, all of which had a wide absorption peak at 300 nm. According to XRD examination, the biogenic MgO-NPs were 13.78, 13.38, and 13.48 nm, respectively in crystal size. In SEM analysis, the biosynthesized MgO-NPs displayed agglomeration, and EDX validated the elemental composition of these biogenic MgO-NPs. Besides, their FTIR spectra revealed distinct bands for phytochemical functional groups as well as MgO. The biogenic MgO-NPs revealed a considerable amount of TPC and TFC values while the biogenic MgO-NPs demonstrated a significant free radical scavenging activity as measured by inhibition of DPPH, ABTS•+, and NO compared to different standards; also, they exhibited higher FRAP values. Pretreatment with Seed-MgONP and PericarpMgONP resulted in a significant reduction of cardiac biomarkers i.e., cardiac Troponin-I (cTnI), creatine kinase (CK-MB), and aspartate aminotransferase (AST); whereas Pulp-MgONP led to a moderate decrease in these biomarkers. Seed-MgONP and Pericarp-MgONP were more successful in reducing lipid levels than Pulp-MgONP. Nanoparticles were assayed in BHK-21 and Vero cell lines both of which showed no toxicity for the nanoparticles. According to the findings of the mRNA expression study,

http://dx.doi.org/10.29228/jrp.749

Seed-MgONP effectively downregulated the expression of apoptotic genes: p53 and caspase-3. Pulp-MgONP, Seed-MgONP, and Pericarp-MgONP, on the other hand, all restored normal SOD gene expression levels. The histopathological observations were mostly focused on the disruption of cardiac fibers and myofibrillar disintegration, which are consistent with the biochemical findings. Therefore, our research suggests that MgO-NPs derived from the fruit pulp, seed, and pericarp of *Tamarindus indica* can serve as powerful antioxidants and their administration may be effective in protecting the heart from DOX-induced cardiotoxicity.

Keywords: MgO-nanoparticles; *Tamarindus indica*, p53, and caspase-3 gene expression; Troponin-I; cardiac toxicity.

http://dx.doi.org/10.29228/jrp.749