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Notice for the PhD Viva Voce Examination

Ms Chole Pranjali Bajrang (Registration Number: 2170250), PhD scholar at the School of Sciences, CHRIST (Deemed to be University), Bangalore will defend her PhD thesis at the public viva-voce examination on Monday, 9 September 2024 at 9.30 am in Room No. 044, Ground Floor, R & D Block, CHRIST (Deemed to be University), Bengaluru - 560029.

Title of the Thesis	:	**A Study on Nutritional, Biochemical and Pharmacological Property of *Punica granatum* L.**
Discipline	:	**Botany**
External Examiner (Outside Karnataka)	:	**Dr K Arun Kumar** Professor Department of Plant Science Central University of Kerala Periye, Kasaragod Kerala - 671320
External Examiner (Within Karnataka)	:	**Dr K N Amruthesh** Professor Department of Botany Manasa Gangothri Mysore University Mysore, Karnataka
Supervisor	:	**Dr Manjunatha B T** Professor Department of Life Sciences School of Sciences CHRIST (Deemed to be University) Bengaluru – 560029 Karnataka

The members of the Research Advisory Committee of the Scholar, the faculty members of the Department and the School, interested experts and research scholars of all the branches of research are cordially invited to attend this open viva-voce examination.

Registrar

Place: Bengaluru
Date: 31 August 2024

ABSTRACT

Biologically active components present in different medicinal plants which protects the human from diseases and allow health benefits. In the present study, the nutritional, biochemical and pharmacological analysis of the different parts of *Punica granatum* was done. In the nutritional profiling, moisture content was found high in the flower (9.63%) followed by leaf, peel, root, stem and fruit. Ash content was recorded higher in the stem (30%/gm) followed by root, leaf, flower, fruit and peel. Also, the macro and micro elements present in different parts of *P. granatum* were analysed. The fruit recorded the highest amount of nitrogen and phosphorus whereas the peel was recorded with more potassium. The phytochemical quantification showed the major content of carbohydrates in the flower (317.96 mg/g) and leaf (315.62 mg/g). The protein in fruit (69 mg/g) and proline in root (19.54 mg/g) were recorded. *P. granatum* peel was recorded with maximum phenolic and flavonoid content. It showed a high antioxidative response in comparison to other plant parts.

This study also aims to explore the use of *P. granatum* seed oil as a reducing agent for the synthesis of cobalt nanoparticles. These cobalt particles showed a λmax at 279.88 nm for UV-visible spectrometry analysis. Furthermore, X-ray Diffraction, Fourier Transform Infrared Spectroscopy, Field Emission Scanning Electron Microscope and Dynamic Light Scattering were performed to confirm the nature of these nanoparticles. The pharmacological potential of these cobalt oxide nanoparticles was tested against microbial pathogens. The results suggest that these nanoparticles exhibited significant activity against various human bacterial and fungal pathogens. Additionally, *in vitro* cytotoxicity analysis of CoONPs had targeted MCF-7 cancer cells with a significant IC50 value compared to non-cancerous cells (L929). This study concluded that 'Bhagwa' variety of *P. granatum* is medicinally high valuable plant, with huge antioxidant, phytochemical, and pharmacological benefits. The green synthesized CoONPs using *P. granatum* show significant pharmacological applications. Furthermore, this study has implications for medical research centers and pharmaceutical industries in addressing modern challenges such as increasing antibiotic resistance in communities.

Keywords: Punica granatum L., green synthesis, seed oil, cobalt oxide nanoparticles.

Publications:

1. **Pranjali Bajrang Chole**, Manjunath BT. Nutritional, biochemical and antioxidant activities of edible and non-edible parts *Punica granatum* L. *Medicinal Plants*, vol. 16, no.1 pp. 182-190, 2024.

2. **Pranjali Bajrang Chole**, Manjunath BT. Green synthesis of cobalt oxide nanoparticles with in-vitro cytotoxicity assessment using pomegranate (*Punica granatum* L.) seed oil: A promising approach for antimicrobial and anticancer application, *Plant Science Today*, vol. 11, no. 2, 2024.