

Notice for the PhD Viva Voce Examination

Ms K Dharani Shree, Registration Number: 2190018, PhD Scholar at the Department of Life Sciences, School of Sciences, CHRIST (Deemed to be University) will defend her PhD thesis at the public viva-voce examination on Friday, 27 February 2026 at 9.30 am in Room No. 044, Ground Floor, R&D Block, CHRIST (Deemed to be University), Bengaluru - 560029, Karnataka, India.

- Title of the Thesis** : **Bioprospecting Seed-Borne Metabolites, Endophytic Bacteria and their Metabolic Synergy in Butterfly Pea with Anti-Diabetic and Plant Growth Potential**
- Discipline** : **Biotechnology**
- External Examiner - I** : **Dr Tartte Vijaya**
Professor
Department of Botany
Sri Venkateswara University
Tirupati - 517502
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- External Examiner - II** : **Dr Kotresha D**
Associate Professor
Department of Studies in Botany
Davangere University
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- Supervisor** : **Dr Manjunatha B T**
Professor (Former)
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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.

Place: Bengaluru
Date: 16 February 2026



Registrar

ABSTRACT

This study focuses on the seed-borne metabolites and seed-associated endophytic bacteria of the Butterfly Pea plant. The methanolic extracts of Butterfly Pea seeds of two main varieties, the Blue flowered and White flowered variety seeds, were screened for phytochemicals. They exhibited a significant antioxidant potential along with the anthocyanin pigments within the seeds. Seed-associated endophytic bacteria isolated were identified within diverse genera, highlighting the ecological and functional richness of the seed microbiome. Following the isolation, both plant and bacterial extracts were analyzed through GC-MS to investigate their metabolomic profiles. The comparative analysis revealed shared metabolites across both sources, suggesting a metabolite exchange or influence between the plant and its endophytes. Certain compounds followed known precursor pathways, where either plant or microbial metabolites served as substrates, indicating a metabolic synergetic mechanism between the two communities. Additionally, novel metabolites were detected, indicating de novo biosynthesis driven by microbial activity. To assess the therapeutic potential, the seed extract anti-diabetic evaluation via in vitro and in silico approaches was performed, where the significant inhibition of α -amylase and α -glucosidase enzyme activity was recorded. In silico docking studies confirmed strong binding affinities of key metabolites, particularly palmitic acid, to diabetic target proteins, supporting their inhibitory efficiency. Further, the endophytes were evaluated for the plant growth-promoting (PGP) potential. All isolates exhibited positive traits in biochemical assays, including enzyme production and nutrient solubilization. The Soil fertility analysis post-treatment with Seed endophytic bacteria revealed the broadest impact, consistently enhancing macro- and micronutrient levels across different soil types. This study underscores the significance of Butterfly Pea seeds as reservoirs of therapeutically relevant metabolites and agriculturally beneficial microbes supporting a holistic bioprospecting framework for future innovations in agriculture and pharmaceuticals.

Keyword: *Seed Metabolites, Seed Endophytic Bacteria, Butterfly Pea, Plant-Microbe Synergy, Plant Growth, Anti- Diabetic, Soil Fertility*

Publications:

- 1) **Dharani, S. K., & Manjunath, B. T.** (2024). Phytochemical screening of seeds of blue and white varieties of heirloom butterfly pea (*Clitoria ternatea* L.). *Medicinal Plants - International Journal of Phytomedicines and Related Industries*, 16(4), 746–753. <https://doi.org/10.5958/0975-6892.2024.00078.7>
- 2) **Dharani, K. S., & Manjunath, B. T.** (2025). GC-MS profiling of metabolites in blue and white varieties of heirloom butterfly pea (*Clitoria ternatea* L.) seeds. *Medicinal Plants - International Journal of Phytomedicines and Related Industries*, 17(2), 300–312. <https://doi.org/10.5958/0975-6892.2025.00030.6>
- 3) **Dharani, K. S., & Manjunath, B. T.** (2025). Comparative Study of Anthocyanin and Antioxidant Profile of Blue and White Varieties of Butterfly Pea Seed (*Clitoria ternatea* L.). *Journal of Environmental Biology*. (Under Review).