



**CHRIST**  
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BANGALORE · INDIA

## Notice for the PhD Viva Voce Examination

Ms Danilyn S Omnes (Registration Number: 2071705), 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 Friday, 14 March 2025 at 10.30 am in Room No. 044, Ground Floor, R & D Block, CHRIST (Deemed to be University), Bengaluru-560029, Karnataka, India.

<b>Title of the Thesis</b>	<b>:</b>	<b>Exploring the Phytochemical Properties, Antioxidant Potential and Safety Profile of Strelitzia Reginae Banks</b>
<b>Discipline</b>	<b>:</b>	<b>Botany</b>
<b>External Examiner - I</b>	<b>:</b>	<b>Dr P Chandramati Shankar</b> Professor Department of Biotechnology Yogi Vemana University Kadapa-516005 Andhra Pradesh
<b>External Examiner - II</b>	<b>:</b>	<b>Dr Govindappa M</b> Professor and Chairman Department of Studies in Botany Davangere University, Shivagangotri Davangere-577007 Karnataka
<b>Supervisor</b>	<b>:</b>	<b>Dr Jobi Xavier</b> Associate 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.

**Place:** Bengaluru  
**Date:** 04 March 2025

  
**Registrar (Academics)**

## ABSTRACT

*Strelitzia reginae*, commonly known as the Bird of Paradise, is a decorative shrub endemic to Southern Africa. This study marks the first comprehensive investigation into the safety of *S. reginae* leaf and root extracts through its physico-chemical properties, elemental analysis by Atomic Absorption Spectrometry (A.A.S.) method, qualitative and quantitative phytochemicals, GC-MS analysis, antioxidant activity, antimicrobial potential, oral acute toxicity assessments and histopathological examinations in Zebrafish (*Danio rerio*). The interest in this research arises from the historical use of *S. reginae* components by various indigenous South African societies to treat conditions like swollen glands, sexual diseases and urinary tract infections. The leaf and root of *S. reginae* were extracted with the Soxhlet technique of extraction and further concentrated with a rotary evaporator. Standard protocols assessed the plant's elemental compounds, physico-chemical properties, qualitative and quantitative phytochemicals, GC-MS analysis, antioxidant activity, and antimicrobial potential by well-diffusion test. The A.A.S. exhibited that the leaf and root contain more calcium and less of cadmium content. Preliminary phytoconstituents showed medicinally important alkaloids, anthraquinones, tannins, carbohydrates, flavonoids, saponins, phenols, proteins, and amino acids.

The quantitative phytochemical analysis revealed that the leaf has higher total phenolic, flavonoid, chlorophyll, carbohydrates, protein, and proline contents than root. A GCMS analysis verify the existence of bioactive components like squalene, hexatriacontane, phytol, hexacosane, heptacosane, bis (2-ethylhexyl) phthalate and octacosane. The antioxidant analysis revealed excellent activity in leaf and then root sample. The antimicrobial property was investigated for the first time using a well-diffusion approach, and both plant parts revealed significant antibacterial and antifungal efficacy against recognized strains. Drawing upon the biological similarities between Zebrafish and humans, who share a majority of their genes, this study represents the first attempt to evaluate the toxicity and histopathology of *S. reginae* using *D. rerio* as the test model, aligning with the OECD recommendations outlined in Article 203. The oral acute toxicity tests were conducted using ethanolic leaf and root extracts of *S. reginae*, revealing toxicity at higher concentrations of 1200 mg/L for leaf and 500 mg/L for root. While demonstrating reduced harm to *D. rerio* at lower doses. As observed in the histopathology examination, exposure to higher concentrations of *S. reginae* extract induced severe histological abnormalities in the Zebrafish's gills, liver, kidneys, intestines, and brain for both plant samples. *S. reginae* also showed anticancer activity against MCF- 7 and HT-29 cell lines. This work contributes greatly to our understanding of *S. reginae*'s safety profile and its potential therapeutic applications for enhancing well-being.

**Keywords:** *Strelitzia reginae*, *Danio rerio*, Antioxidants, GC-MS, Toxicity, Histopathology, Cytotoxicity.

### Select Publications:

1. Omnes, D. S., Xavier, J., & Suresh, A. (2024). Assessing oral acute toxicity and histopathological effects of *Strelitzia reginae* Aiton leaf extracts in Zebrafish (*Danio rerio* Hamilton). *Plant Science Today*, 11(2).
2. Omnes, D. S., Xavier, J., & Suresh, A. (2024). Analyzing the therapeutic significance of *Strelitzia reginae* banks: Exploring its physico-chemical properties, elemental makeup, and antimicrobial activity.