

Ph.D. Research Proposal

Submitted to:

Department of Food Science and Nutrition

Kalasalingam Academy of Research and Education (KARE)

Krishnankoil, Tamil Nadu – 626126

Title of the Research Proposal

“A Novel Methods for Preparation, Preservation, Formulation and Delivery of Neutral Plant and Flower Based Essences and Herbal Supplements”

1. Introduction

Nutraceuticals have become an integral part of modern nutrition, addressing health, immunity, and preventive wellness. Among them, **plant- and flower-based supplements** offer an unexplored niche of natural therapeutic solutions. Traditional systems like **Bach Flower Remedies and Indian flower healing systems** have used flower extracts for emotional and physiological wellness. However, standardization, safety, and consumer-friendly formats remain key gaps in scientific acceptance.

This research aims to integrate **traditional flower remedies** into **modern nutraceutical forms** (globules, pills, and tinctures), focusing on **shelf life, microbiological safety, stability, and nutrient delivery efficiency**.

2. Objectives of the Study

- To develop a **standardized manufacturing protocol** for plant and flower-based nutraceuticals and health supplements.
 - To establish methods for **preservation, ppm standardization, and formulation into solid and liquid dosage forms** with no potency involved.
 - To evaluate **shelf life, microbiological quality, and pH stability** under various storage conditions.
 - To assess **functional and emotional wellness benefits** through controlled consumer trials.
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3. Research Questions

- Can flower essences be preserved and delivered effectively in nutraceutical formats without compromising bioactivity?
 - How does **delivery form (liquid vs. solid)** affect absorption and shelf-life stability?
 - Can **ppm standardization and pH buffering** ensure consistency and safety in food-grade flower remedies?
 - Do **plant and flower-based nutraceuticals** offer measurable emotional and cognitive benefits?
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4. Review of Literature

- Overview of Bach Flower Remedies and Indian traditional flower systems
 - Previous research on edible flowers and their nutritional/medicinal value.
 - Nutraceutical delivery innovations: globules, encapsulation, functional foods.
 - Standardization techniques using **ppm meters, membrane filtration, and natural preservatives.**
 - Challenges in integrating plant-based remedies into food-safe, regulatory-approved formats.
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5. Methodology

5.1 Raw Material and Formulation

- Selection of flowers: Safe, edible varieties with proven therapeutic value.
- Extraction methods:
 - **Sun Method** for flowering parts.
 - **Boiling Method** for herbs and non-flowering plants.
 - **Dissolving Method** for herbal powders.
- Preservation with glycerine, vinegar, or food-grade alcohol.

5.2 Quality Control and Testing

- **PPM standardization** (target: 60–70 ppm) for consistency.
- **Microbial testing:** Aerobic plate count, yeast & mould, coliforms.

- **pH and temperature stability** tests over 3, 6, and 12 months.
- **Shelf-life simulation** under accelerated and ambient storage.

5.3 Nutritional and Functional Analysis

- Small-scale **human volunteer trials** to assess mood, sleep, and cognition.
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6. Expected Outcomes

- Validated, scalable flower remedy manufacturing process suitable for the food supplement industry.
 - Data-backed proof of **superior bioactivity** and shelf life in standardized formulations.
 - Novel delivery formats (e.g., pills, globules) with documented consumer safety and usability.
 - Contribution to **scientific literature and product innovation** in food-based wellness.
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7. Significance of the Study

This research supports India's emerging nutraceutical market with **evidence-based alternatives to synthetic supplements**, focusing on **natural, safe, and effective plant-based solutions**. The preparation framework will ease the raw materials inventory management and it will empower the food science industry to **commercialize traditional wisdom** while maintaining modern quality standards.

8. Timeline (36 Months)

Phase	Duration
Literature Review	Months 1–3
Formulation & Extraction	Months 4–6
Preservation & PPM Studies	Months 7–9
Microbiology & Shelf Life	Months 10–18
Bioactivity Trials	Months 19–26

Phase	Duration
Data Analysis & Optimization	Months 27–30
Thesis Writing	Months 31–36

10. Applicant Details

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