

TANU SINGH

PhD (Food and Nutrition Sciences)

✉ stanu608@gmail.com ☎ +91-8318807976 📍 Dehradun

🏠 Google Scholar 🌐 LinkedIn



PROFESSIONAL PROFILE

Food science researcher with strong expertise in plant-based protein extraction, process optimization, and product development. Experienced in translating laboratory-scale research into functional food formulations and biodegradable packaging solutions. Skilled in advanced processing technologies, analytical characterization, and data-driven optimization for food industry R&D and sustainable innovation.

CORE EXPERTISE

- Plant-based protein & starch processing
- Functional food and protein bar development
- Process optimization & scale-up readiness
- Ultrasound-assisted & enzymatic extraction
- Edible & biodegradable food packaging
- Food quality, safety & sensory

EDUCATIONAL QUALIFICATIONS

Ph.D. (Food Science and Nutrition) 2022 – 2026
School of Health Sciences and Technology, UPES, Dehradun, India Uttarakhand

M.Sc. (Centre of Food Science and Technology) 2021
University of Allahabad, Uttar Pradesh, India Uttar Pradesh
9.35 /10.0 CGPA

B.Voc. in Food Processing 2019
Ewing Christian College, University of Allahabad, Uttar Pradesh, India Uttar Pradesh
7.62/10.00 CGPA

PUBLICATIONS

1. Singh, T., Ghanghas, N., Prabhakar, P. K., & Madhumita, M. (2025). Perilla (*Perilla Frutescens* L.) Seed Protein Isolate: A Current Status on Emerging Extraction Processes, Multilevel Techno-Functional Properties and Industrial Applications. *Food Reviews International*, pp. 1–25. (IF :6. 1)

2. Singh, T., Awasthi, R., Prabhakar, P. K., & Madhumita, M. (2025). Optimization of ultrasound mediated extraction of perilla protein isolate: study of ultrasonication effect on amino acid profile and functional characteristics. *Journal of Food Measurement and Characterization*, pp. 1–21. (IF :3. 3)
3. Singh, T., Awasthi, R., Prabhakar, P. K., & Madhumita, M. (2025). Enzymatic Hydrolysis of Perilla Seed Protein: Optimization, Physico-Functional Evaluation, and Structural Characterization. *Food Analytical Methods* 1–20. (IF :3. 2)
4. Singh, T., Pandey, S., Kumar, A., Madhumita, M., & Purewal, S. S. (2025). Amaranth millet as a source of sustainable protein: extraction and functional analysis of its protein concentrate. *Journal of Food Measurement and Characterization*, pp. 1–9. (I F :3. 3)
5. Singh, T., Lai, C. W., Kumar, A., Madhumita, M., & Purewal, S. S. (2025). Kinetic Modeling and Optimization of Perilla Protein Isolate Extraction via Ultrasonication and Enzyme Assistance. *Journal of Food Measurement and Characterization*, 1–9c (I F :3. 3).
6. Madhumita, M., Deol, P., Singh, T., & Prabhakar, P. K. (2024). Emerging technologies for extraction of functional components. In *Adding Value to Fruit Wastes*, 49–76.

PATENTS

Allergen-Free Nutritional Sustainable Food Formulation Using Ultrasound-Assisted Extraction of Perilla Seed Protein Isolate

Application No.: 202511105198 | Indian Patent |

IPR Submitted: August 2025

Status: Published

Manuscripts Communicated

1. Singh, T. et al. Trends and advances in development of photodynamic, photothermal, and intelligent food packaging: A Review" has been submitted to *Comprehensive Reviews in Food Science and Food Safety* (Under revision).
2. Singh, T. et al. Development and Evaluation of a Protein Bar Formulated with Perilla Protein Isolate: Nutritional Profile, Toxicity Assessment, Sensory Attributes, and Shelf-Life Stability has been submitted in *Food and Byproducts Processing* (Under revision).
3. Singh, T. et al. Development and Characterization of a Bioactive Gelatin-Chitosan Edible Film Incorporating Mushroom Extract and Reinforced with Tannic Acid and Curcumin for Fresh Chicken Preservation has been submitted in *Food Hydrocolloids* (Under revision).

RESEARCH EXPERIENCE

Doctoral Researcher (Food R&D)

08/2022 – 03/2026

UPES, Dehradun, India

Dehradun

- Extracted and characterise the plant protein isolates from perilla seeds and agro-industrial by products using alkaline, ultrasound-assisted, and enzymatic techniques.
- Optimized extraction parameters using statistical and kinetic modeling tools for improved yield and functionality.
- Conducted physicochemical, functional, structural, and thermal characterization relevant to industrial food applications.
- Developed protein bars and functional food prototypes with enhanced nutritional and sensory attributes.
- Designed and evaluated biodegradable and edible films for active food packaging applications.
- Performed quality, safety, and cytotoxicity assessments (zebrafish model).
- Prepared industry-relevant documentation, research manuscripts, and patents.

TECHNICAL SKILLS & RESEARCH COMPETENCIES

Protein & Ingredient Processing

- Alkaline extraction, isoelectric precipitation.
- Ultrasound-assisted and enzyme-assisted modification.
- Functional ingredient development

Analytical & Structural Characterization

- FTIR, DSC, TGA, XRD, SEM, AFM
- UV-Vis spectrophotometry, SDS-PAGE
- Soxhlet extraction

Functional & Physicochemical Properties

- Solubility, emulsifying and foaming properties
- Water and oil holding capacity
- Food physicochemical analysis

Film, Packaging & Sustainability

- Edible and biodegradable films development.
- Active compounds & controlled-release studies.
- Sustainable food packaging materials

Food Product Development

- Functional foods and protein-based products.
- Nutritional profiling & shelf-life evaluation.
- Sensory evaluation & consumer relevance

Biological & Safety Assessment

- Cytotoxicity testing (zebrafish model)

Instrumentation & Software

- Ultrasonic processor, lyophilizer (freeze dryer), SDS-PAGE, Soxhlet, oil expeller, UV-Vis spectrophotometer, FTIR, XRD,
- Origin, GraphPad Prism, Design-Expert, SPSS, MS Excel

CONFERENCES & WORKSHOPS

Awarded **3rd prizes in poster presentations**, most notably for my work titled “*Optimization of Enzyme-Assisted Extraction and Structural Characterization of Perilla Seed Protein Isolates: Physicochemical and Functional Assessment*” at a national symposium organized by Banaras Hindu University in collaboration with AFST(I) and the Indian Dairy Association held on 25th & 26th October, 2024.

Presented a poster titled “*Extraction of Perilla frutescens l. seed and its utilization on food formulation*” in International Young Research Conclave 20th January 2023 organized by UPES Dehradun.

Attended National seminar on “*Millet- the future food*” on 12th and 13th January 2023 at Department of Food Processing Technology, Ghani Khan Choudhury Institute of Engineering and Technology, West Bengal.

Online Training Programme on Utilization of Ultrasound Techniques in Food Processing Centre of Excellence in Nonthermal Processing (CENTP), National Institute of Food Technology, Entrepreneurship and Management (NIFTEM-T), Thanjavur, India

Presented a **Flash Presentation on** Optimization of Enzyme-Assisted Extraction of Perilla Seed Protein Isolates, International Young Research Conclave, UPES Dehradun (20 January 2024).

Professional Training & Experience

Exp-2 months hands-on experience at Parag Dairy Industry, Lucknow, Uttar Pradesh. (2019)

Operated equipment for milk and milk product processing

Training 5 days at NIT Rourkela (2024)

Plant Proteins-Role of Cutting-Edge Technologies in Protein Modification, NIT Rourkela, India.

References

1. Prof. Amit Kumar

School of Health Sciences and Technology,
University of Petroleum and Energy Studies,
Energy Acres, Dehradun 248 007, Uttarakhand, India
Contact: +91-8091351356

Email: mittuchem83@gmail.com , kumar.amit@ddn.upes.ac.in 

2. Dr. Rajendra Awasthi

School of Health Sciences & Technology,
University of Petroleum and Energy Studies,
Energy Acres, Dehradun 248 007, Uttarakhand, India

Contact: +91-7983271475, +91-9459234530

Email: awasthi02@gmail.com 

3. Prof. Chin Wei Lai

Nanotechnology & Catalysis Research Centre (NANOCAT), Institute for Advanced, Studies (IAS), University of
Malaya (UM), 50603 Kuala Lumpur, Malaysia

Mobile: 0379677022

Email: cwlai@um.edu.my 