Jyoti P. Kakati, Ph.D.

+1 864-207-2768 * jkakati@clemson.edu * www.linkedin.com/in/jyotikakati/ * www.jpkakati.com
Pee Dee Research and Education Center (Clemson University), 2200 Pocket Road, Florence, SC 29506, USA

PROFESSIONAL SUMMARY

- Crop biotechnologist specializing in plant physiology, metabolomics, tissue culture, genetic transformation, and molecular biology
- Demonstrated expertise in protoplast-based gene validation and functional genomics approaches
- Experienced in conceptualizing, designing, and executing research on abiotic stress responses in major crops across controlled and field environments
- Proven scientific communicator with multiple peer-reviewed publications and oral/poster presentations at international conferences
- Collaborative leader with a strong work ethic, driving multidisciplinary research and team productivity

RESEARCH EXPERIENCE

Associate Scientist- Crop Biotechnology 10.2024 – Present

Clemson University, Clemson, SC, USA

- Developing transgenic Peach rootstock to combat Armillaria Root disease in peach.
- Leading the development of genetically stable atoxigenic *Aspergillus flavus* and *A. parasiticus* strains to mitigate pre- and postharvest aflatoxin contamination in peanuts using the CRISPR-Cas9 system.
- Developing dsRNA-based biopesticides for non-transgenic, sustainable, species-specific fungal control.
- Managing a research lab for a team of eight, overseeing ongoing projects, coordinating experiments, and handling supply procurement to ensure smooth lab operations.

Graduate Research Assistant 09.2020 – 08.2024

Clemson University, Clemson, SC, USA

- Led research studies on the effect of drought on soybeans' germination and root traits.
- Identified unique biomolecules in soybean seeds associated with drought tolerance during germination.
- Examined the effect of heat and drought stress on soybeans' protein content and oil composition.
- Evaluated the effect of heat stress on peanuts’ oil composition and yield.

Senior Research Fellow 12.2019- 08.2020

Indian Institute of Technology Guwahati, Assam, India

- Coordinated research between industry and laboratory to develop the ceramic membrane-based process for treating and recycling paper mill effluent.
- Maintained research materials, equipment, and facilities in good working order.
- Oversaw equipment or supplies necessary for the ongoing projects.

Senior Research Fellow 10.2015- 04.2016

Indian Institute of Technology Guwahati, Assam, India

- Handled bioreactors for optimizing hyaluronic acid production that comply with FDA regulations.
- Generated high-quality data for accurate analysis, resulting in scientific publications.
- Developed and maintained lab webpage for public appearance.

System Engineer 12.2012- 03.2015

Tata Consultancy Services Chennai, Tamil Nadu, India

- Developed technical and professional skills to thrive in dynamic environments while ensuring stable, efficient operations and supporting production teams to achieve organizational goals with accountability.

RESEARCH INTERESTS

- *Sustainable crop protection & resilience*: Designing biopesticide and RNA-based control strategies and investigating plant–microbe interactions to enhance disease resistance, reduce toxin contamination, and improve agricultural sustainability
- *Integrative stress biology & multi-omics*: Dissecting heat and drought stress responses using physiological, molecular, and metabolomic approaches to understand carbon partitioning, seed composition, and crop performance under climate change
- *Genome engineering for climate-resilient crops:* Developing CRISPR/Cas9 and transgenic platforms to functionally validate genes controlling abiotic stress tolerance, disease resistance, and yield/quality traits in horticultural and oilseed crops

EDUCATION

Doctor of Philosophy: Plant Science *(GPA 4.0/4.0)* 08.2020- 08.2024
Clemson University - Clemson, SC, USA
Advisor: Sruthi Narayanan, Ph.D.

Dissertation title: *Enhancing Crop Resilience: Physiological and Omics Approaches for Drought and Heat Stress Tolerance in Soybean and Peanut*

- Identified two breeding potential soybean genotypes from a global collection of over 350 genotypes that can maintain better germination percentage and root traits under water stress conditions.
- Confirmed the heat and drought stress resiliency of high protein (≥50 % seed-protein) breeding lines for developing new varieties with enhanced nutritional value under climate change-associated stresses.
- Completed lipidomic and/or metabolomics work in major oil crops, i.e., soybean and peanut.
- Published five articles in peer-reviewed journals and presented the work at multiple conferences.

Master of Technology: Biotechnology *(CGPA 8.84/10.0)* 07.2017- 07.2019
Indian Institute of Technology, Guwahati, Assam, India
Advisor: Lingaraj Sahoo, Ph.D.

Thesis title: *Biotechnological Intervention in Scented Rice of Northeast India for Yield Enhancement*

- Optimized the *Agrobacterium*-mediated transformation protocol for indica rice (*Kola joha*), generated transgenic lines with genes of interest, and completed their molecular characterization.
- Got trained in critical skills like plant tissue culture, physiology, transgene expression, and routine laboratory operations to carry out independent research.
- Presented research findings at professional conferences.

Bachelor of Technology: Biotechnology *(CGPA 8.31/10.0)* 08.2008- 05.2012
Anna University Chennai - K.S. Rangasamy College of Technology, Tamil Nadu, India

Project title: *Isolation, Characterization, and In vitro Culturing of Paenibacillus spp. for the Management of White Grubs and Other Agricultural Applications*

- Published three research articles in peer-reviewed journals.
- Demonstrated outstanding academic performance and active participation in various extracurricular activities, including research and technical workshops.
- Received full sponsorship to participate in Jagriti Yatra-2011 to enhance entrepreneurship skills.

One US patent filed; Published 10 peer-reviewed articles [Citations: 123; h-index: 6; i10-index: 5]

LEADERSHIP POSITIONS

- Plant and Env. Sciences-Graduate Students Asso., Clemson University, *President* 2021-2022
- Students Association- Dept. of Biotechnology, K.S.R. College of Technology, *Vice-President* 2011-2012
- Computer Education Center, Sualkuchi, Assam, India, *Managing Director (Remote)* 2016- Present

AWARDS

- ASA-CSSA-SSSA Encompass Fellow, sponsored by Bayer Crop Science, *Recipient* 2023-2024
- Outstanding Graduate Research Assistant award-2023, Clemson University, *Recipient* 2023
- Gerald O. Mott Award in Crop Science, Crop Science Society of America, *Recipient* 2023
- Wade Stackhouse Fellowship ($20000), Clemson University, *Recipient* 2021-2023
- Clemson University Graduate Fellowship ($17,000), *Recipient* 2020-2023
- Graduate Student Poster Competition, Crop Science Society of America, *Prize Winner* 11.09.2022
- Graduate Travel Grant ($1500), Clemson University, *Recipient* 2021-2022
- Graduate Student Travel Scholarship ($750), Agronomic Science Foundation, *Recipient* 2022
- Science Academies' Summer Research Fellowship, India, *Recipient* 2018
- Cleared national-level competitive exams (GATE in Biotechnology, India) 2012, 2017
- Received Teaching/Research Assistantship from the Ministry of Human Resource Development, Govt. of India, for the master's (M. Tech) program
- Best Undergraduate Student Award, K.S.R. College of Technology, India 2011-2012
- Practicum Project Award, Dept. of Biotech., K.S.R. College of Tech., India, *Prize Winner* 2012
- Best Project Award, Dept. of Biotechnology, K.S.R. College of Tech., India, *Prize Winner* 2011
- Oral presentation at the National Level Technical Symposium, India, *First Prize Winner* 2011
- Meritorious Student Award, Dept. of Biotech., K.S.R. College of Tech., India, *Recipient* 2011
- Science Academies' Summer Research Fellowship, India, *Recipient* 2011
- Jagriti Yatra 2011: A Journey of Awakening (Travel Award), India, *Recipient* 2011

TRANSFERABLE SKILLS

- Genetic transformation of plant tissue and fungi using *Agrobacterium*, PEG and biolistic methods.
- Molecular techniques such as Gel Electrophoresis, DNA and RNA isolation, PCR, RT-PCR, qRT-PCR, Southern Blotting, SDS-PAGE and Western Blotting.
- Chromatin Immunoprecipitation (ChIP) and co-immunoprecipitation (Co-IP) to study protein-protein and protein-DNA interactions.
- Microbial isolation, identification, and culturing techniques to identify novel bacterial strains.
- Proficient in working with model plants (*Nicotiana benthamiana, Arabidopsis thaliana*, and rice) and oil crops (soybean and peanut) under laboratory, growth chamber, greenhouse, and/or field conditions for addressing abiotic stresses (heat and/ or drought).
- Ability to perform statistical analysis using JMP (Proficient), SAS (Proficient), and R (Basic).

MENTORSHIPS

- Co-mentored two undergraduate students (during Ph.D.) in completing their practicum.
- Taught an undergraduate course (PES 4960- Creative Inquiry- Cover crop study) as a Teaching assistant.
- Trained over twenty undergraduate and nine high school students for research and development works during Ph.D. and post-Ph.D.
- Served as a Teaching and Research Assistant at IIT Guwahati during M.Tech. (2017-2019).

PATENT FILED (US)

- Rustgi, S., Saripalli, S., Kakati, J.P., Saski, C.A. Transgenic peach rootstocks for treatment of Armillaria root rot and carbon recycling (Application# USPTO 63/743,912)

INVITED TALK

- "Genetic Engineering Approaches for Sustainable Control of Soil-Borne Pathogens in Peach and Peanut" at the International Conference on Environmental Challenges and Bioresource Innovations for a Sustainable Future (ICECBISF-2026), B. Borooah College (Autonomous), Guwahati, India,13–14 March 2026 (Online).

PEER-REVIEWED ARTICLE PUBLISHED (*First Author*)

- **Kakati, J.P.**; Fallen, B.; Armstrong, P.; Yan, S.; and Narayanan, S. High-protein soybean lines with stable seed protein content under heat and drought stresses. J. Agr. Food Res. 2024, 18.
- **Kakati, J.P.**; Fallen, B.; Bridges, W.; Narayanan, S. Characterization of soybean (*Glycine max* L. Merr.) population for germination and seedling root traits under water stress. Agronomy 2022, 12, 1944*

  **This article was recognized as the "Editor's Choice Article" for 2022.*
- **Kakati, J.P.**; Zoong Lwe, Z.S.; Narayanan, S. Heat stress during the early flowering stage did not affect seed fatty acid contents in conventional oleic peanut varieties. Peanut Sci. 2022, 49.
- **Kakati, J.P.**; Ponmurugan, P.; Rajasekaran, N.; Mythili, G. B. Effect of textile effluent treatment plant sludge on the growth metabolism of green gram (*Vigna radiata* L). Int J Environ Pollut. 2013, 51, 79-90.

PEER-REVIEWED ARTICLE PUBLISHED (*Contributing Author*)

- Saripalli, G.; **Kakati, J.P.**; Ou, X.; Liu, B.; Rustgi, S. Reprogramming meiosis to enhance diversity and chromatin introgression in polyploid crops: A focus on wheat. Adv. Agron. 2025, 196.
- Rustgi, S.; **Kakati, J.P.**; Narayanan, S. Shaping plant architecture for improved productivity: Strigolactones and beyond. Adv. Agron. 2024, 186.
- Rustgi, S.; **Kakati, J.P.**; Jones, Z.T.; Zoong Lwe, Z.S.; Narayanan, S. Heat tolerance as a function of membrane lipid remodeling in the major US oilseed crops (soybean and peanut). J. Plant Biochem. Biotechnol. 2021, 30, 652-667.
- Ghodke, R.S.; **Kakati, J.P.**; Tadi, S.R.R.; Mohan, N.; Senthilkumar, S. Kinetic modeling of hyaluronic acid production in palmyra palm (Borassus flabellifer) based medium by *Streptococcus zooepidemicus* MTCC 3523. Biochem. Eng. J., 2018, 137, 284-293.
- Mythili, G. B.; Ponmurugan, P.; Jeeva, S.E.; Manjukarunambika, K.; Elango, V.; Hemalatha, K.; **Kakati, J.P.**; Mohanraj, R.; Prathap, S. Biosynthesised silver and copper nanoformulation as foliar spray to control bird's eye spot disease in tea plantations. IET Nanobiotechnol. 2017, 11, 917-928.
- Robinson, J.P.; **Kakati, J.P.**; Sebastinraj, J.; Kumaresan, S. *In vitro* seed germination of *Cymbidium aloifolium* (L.) Sw., a potential medicinal orchid from eastern ghats of Tamil Nadu, India. J. Plant Biotechnol. 2017, 44, 343–348.

ABSTRACT/CONFERENCE PRESENTATION (*International Only*)

- Gautam Saripalli, **Jyoti Prasad Kakati**, Sachin Rustgi, "Developing Tools for Genetic Manipulation of Peach for Armillaria Root-Resistant and Beyond," Plant and Animal Genome Conference / PAG 32, San Diego, California, USA, Jan. 9-14, 2026.
- Gautam Saripalli, **Jyoti Prasad Kakati**, Sachin Rustgi, "Building Host Resistance and Developing Management Strategies to Combat Armillaria Root Rot in Peach," Plant and Animal Genome Conference / PAG 32, San Diego, California, USA, Jan. 10-15, 2025.
- **Jyoti Prasad Kakati**, Benjamin Fallen, William C Bridges, and Sruthi Narayanan, "Characterization of a Soybean (*Glycine max* L. Merr.) Population for Germination and Seedling Root Traits Under Water Stress," ASA-CSSA-SSSA International Annual Meetings, Baltimore, MD, 6-9 Nov. 2022. *(Oral Presentation).*
- **Jyoti Prasad Kakati**, Benjamin Fallen, Paul Armstrong, Shuping Yan, and Sruthi Narayanan, "Stability of the High-Protein, Low-Oil (HPLO) Trait of Soybean Under Drought and Heat Stresses," ASA-CSSA-SSSA International Annual Meetings, Baltimore, MD, 6-9 Nov. 2022. *(Poster Presentation).*
- **Jyoti Prasad Kakati**, Sruthi Narayanan, Benjamin Fallen, Matthew Inman, "Root morphological traits that improve soybean emergence under water stress," ASA Southern Branch 2022 Annual Meeting, New Orleans, LA, USA, 12-14 Feb. 2022 *(Oral Presentation).*
- **Jyoti Prasad Kakati**, Zolian Zoong Lwe, and Sruthi Narayanan, "Heat stress during the early flowering stage will not affect seed fatty acid contents in peanut," ASA-CSSA-SSSA International Annual Meetings, Salt Lake City, Utah, USA, 7-10 Nov. 2021 *(Poster Presentation).*

- **Jyoti Prasad Kakati**, Sruthi Narayanan, Benjamin Fallen, Matthew Inman, "Root morphological traits that improve soybean germination under water stress," ASA-CSSA-SSSA International Annual Meetings, Salt Lake City, Utah, USA, 7-10 Nov. 2021 *(Poster Presentation).*
- **Jyoti Prasad Kakati**, Avishek Dey, Prabin Kumar Sharma, Sanjeev Kumar, G. J. N. Rao and Lingaraj Sahoo "An improved and efficient protocol for the transformation of scented rice of Northeast India," Indian Plant Science Congress, SRM Institute of Science and Technology, TN, India, 23-25 Jan. 2019. *(Poster)*
- Ponmurugan. P, **Jyoti Prasad Kakati**, R. Subbaiya and J. Philip Robinson "Production of silver Nanoparticles using *Trichoderma atroviride* for the biological control of rhizome rot disease in Turmeric Plants", Intl. Conference on Nanomaterials and Nanotechnology, K.S.R. College of Technology, Tamilnadu, India, 13–16 December 2010.

BOOK CHAPTER

- **Kakati J. P.**, Ingole, H., Rustgi, S. Biomacromolecular Pattern-Guided Breeding for Nutritional Quality and Safety Under Heat Stress in Soybean and Peanut. Smart Crop Development – Adapting Agriculture to Climate Change Actions. 2026. Springer Nature (in press).
- Robinson, J.P.; **Kakati, J.P**. *In vitro* seed germination and protocorm development of *Cymbidium aloifolium* (L.) Sw. from the eastern ghats of Tamil Nadu. Current Scenario in Biotechnology. 2012. Bloomsbury Publishing India Pvt. Ltd., New Delhi-110 015 (ISBN 978-93-82563-27-3).

INTERNSHIP

- *Science Academies' Summer Research Fellowship 2018*
    - Studied the effect of heat stress on *Arabidopsis thaliana* under the guidance of Dr. Ashverya Laxmi at the National Institute of Plant Genome Research, New Delhi, India and acquired hands-on experience in advanced molecular techniques.
- *Science Academies' Summer Research Fellowship 2011*
    - Isolated bacterial strains with various applications, such as managing house flies, combating fungi, and promoting plant growth under Dr. K. Chandrashekara, University of Agricultural Sciences, Bangalore, India.

WORKSHOP ATTENDED

- GIS Workshop Series- Spring 2025 (***18 hours***) — Spring- 2025
- Graduate Student Leadership Workshop, St. Louis, MO, USA — 28 Oct.-2 Nov. 2023
- Graduate Student Leadership Workshop, Baltimore, MD, USA — 6-9 Nov. 2022
- New Frontiers in Plant Biology, IIT Guwahati, Assam, India — 11-13 Nov. 2019
- RNAi and epigenetics in the regulation of gene expression in plants, IIT Guwahati — 11-19 Nov. 2019
- Gene expression and functional analysis for crop improvement, IIT Guwahati — 16-20 Jan. 2018
- Bio fermenter Operation, K.S.R. College of Technology, TN, India — 15-16 Jul. 2011
- Entrepreneurship Development Program for Biotechnology Graduates, TN, India — 1-5 Mar. 2011
- DNA Amplification and Fingerprinting Technology, K.S.R. College of Tech., India — 16-17 Jul. 2010

AFFILIATION

- American Society of Agronomy, *Member* — 11.2020- Present
- Crop Science Society of America, *Member* — 11.2020- Present
- Association of Agricultural Scientists of Indian Origin, USA, *Member* — 11.2021- Present
- Plant and Environmental Sciences Graduate Students Association, *Member* — 2020- 2024
- Foundation for Critical Thinking, Santa Barbara, CA, *Member* — 2022- 2024
- Honor Society of Phi Kappa Phi, Clemson University chapter, *Member* — 2023- 2024
- American Association for the Advancement of Science (AAAS), *Member* — 2024- 2025

PEER REVIEWER OF JOURNAL

- BMC Plant Biology 2023-current
- BMC Archives of Microbiology 2023-current

CERTIFICATION AND TRAINING

- ASA, CSSA, SSSA Peer Review Mentoring Program 2024 (***Six months***) Spring-2024
- Detection, Prevention, and Reporting of Child Abuse and Neglect 04.25.2023
- Hazardous Waste Management 01.04.2021
- Laboratory Safety and Chemical Hygiene 01.02.2021
- Biosafety and Biohazardous Waste Management 12.30.2020
- Initial Radiation Safety Training 10.02.2020

COURSE COMPLETED (in Ph.D.)

- Crop Physiology and Nutrition (PES 8010)
- Principle of Field Crop Production (PES 6210)
- Crop Biotechnology Journal Club (PES 8900)
- Scientific Writing in Biology (BIOL 8140)
- Plant Breeding (PES 6050)
- Statistical Methods-I (STAT 8010)
- Design & Analysis of Experiments (STAT 8050)
- Special Problems in Experimental Statistics (STAT 8110)

TOP 5 STRENGTHS (as per *Gallup.com*)

- Futuristic | Analytical | Belief | Developer | Discipline

LANGUAGE

- English (Proficient)
- Hindi (Proficient)
- Assamese (Native)

MEDIA COVERAGE

- A part of my research work was highlighted in the 'Student Spotlight' session at Field, Lab, Earth podcast on 21st October 2022 (https://fieldlabearth.libsyn.com/improving-edamame-with-dr-bo-zhang)