

Faculty CV

Name

Y. Sreelakshmi

Designation

Professor

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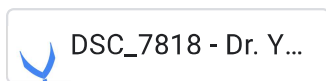
Phone/mobile number

04023134771

Lab/Office room number

Repository of Tomato Genomics Resources (RTGR)

Profile photo (1 photo upto 10 MB)



 Add File

Links of Personal webpage/Google scholar/LinkedIn etc.

<https://rtgr.uohyd.ac.in/>

Broad areas of research (only keywords)

Tomato Functional Genomics, plant development

Professional Experience

Yellamaraju Sreelakshmi obtained her PhD from University of Hyderabad where she worked on the physiology, biochemistry and signal transduction in a light signaling mutant of tomato. As a postdoctoral fellow, she continued to work on mutants and examined their effect on protein-protein interactions in humans (Mason Eye Institute, USA) and hormone signaling pathways in tomato (UOH, India), She is currently working as a Professor at the Repository of Tomato Genomics Resources, Department of Plant Sciences, University of Hyderabad, Hyderabad, India and her lab uses functional genomics approaches to understand the influence of light on tomato fruit development, quality and architecture.

Education/Training

Ph. D. 2001 Plant Sciences, University of Hyderabad.
Thesis Title: 'Regulation and characterization of tomato phenylalanine ammonia-lyases'
M. Sc. 1994 Biochemistry, Osmania University, Hyderabad
B. Sc. 1992 Botany, Genetics, Chemistry, Osmania University, Hyderabad

Detailed research interests (Upto 2 paragraphs or 10 bullet points)

At the University of Hyderabad, the primary research interest of my group is to understand plant development using functional genomics approaches with a special interest in understanding the role of light during fruit development and ripening in tomatoes. Using known tomato mutants, we use proteomics approaches to delineate the mechanisms underlying the gene functions. In the high pigment mutant of tomato, using proteomics approaches, we identified a candidate protein that assists in the sequestration of carotenoids, thus contributing to the high nutritional quality of the mutant fruits. Our study emphasized the role of sequestration mechanisms in boosting nutritional quality.

We also use wild relatives of tomato to examine the diversity in key metabolic pathways not only at the sequence level but also at the functional level. Using tomato mutants that exhibit long shelf life, we identified the candidate proteins that might be responsible for the long shelf life of the mutant fruits. We employ systems approaches by incorporating information from genetic variation, transcript, protein, and metabolite levels to decipher the molecular basis for the diversity in metabolic pathways. Such studies would further our understanding of the evolution of metabolic pathways and aid in metabolic engineering.

In addition, we employ reverse genetics tools like TILLING and genome editing to isolate new alleles in genes of interest and identify their functions. Using these approaches, our lab has identified novel alleles in light signaling genes and transcription factors that affect tomato fruit quality and shelf life. We also identified a few candidate proteins that influence the carotenoid and folate levels in tomato fruits, and we shall be validating them in the coming years. Grants from DBT currently support the work in my lab, and my lab was supported earlier by grants from DBT, SERB, MHRD-IOE, DST, IAEA, and UGC.

Selected publications (upto 5)

1. Suresh Kumar Gupta, Parankusam Santisree, Prateek Gupta, Himabindu Vasuki Kilambi, Yellamaraju Sreelakshmi* and Rameshwar Sharma: "A tomato ethylene-insensitive mutant displays altered growth and higher β -carotene levels in fruit" *Plant Physiology and Biochemistry* 2025 219: 109373
<https://doi.org/10.1016/j.plaphy.2024.109373>
2. Narasimha Rao Nizampatnam, Kapil Sharma, Prateek Gupta, Injangbuanang Pamei, Supriya Sarma, Yellamaraju Sreelakshmi*, and Rameshwar Sharma*: Introgression of a dominant phototropin1 mutant enhances carotenoids and boosts flavor-related volatiles in genome-edited tomato RIN mutants *New Phytologist* 2024 241: 2227–2242 <https://doi.org/10.1111/nph.19510>
3. Kamal Tyagi, Anusha Sunkum, Meenakshi Rai, Amita Yadav, Sanchari Sircar, Yellamaraju Sreelakshmi*, Rameshwar Sharma*: "Seeing the unseen: A trifoliolate (MYB117) mutant allele fortifies folate and carotenoids in tomato fruits" *The Plant Journal* 2022 112: 38–54 (published online 28 July2022)
<https://onlinelibrary.wiley.com/doi/10.1111/tpj.15925>
4. Himabindu Vasuki Kilambi, Alekhya Dindu, Kapil Sharma, Narasimha Rao Nizampatnam, Neha Gupta, Nikhil Padmanabhan Thazath, Ajayakumar Jaya Dhanya, Kamal Tyagi, Sulabha Sharma, Sumit Kumar, Rameshwar Sharma, Yellamaraju Sreelakshmi*: "The new kid on the block: A dominant-negative mutation of phototropin1 enhances carotenoid content in tomato fruits" *The Plant Journal* 2021 106: 844-861.
<https://onlinelibrary.wiley.com/doi/10.1111/tpj.15206>
5. Kapil Sharma, Soni Gupta, Supriya Sarma, Meenakshi Rai, Yellamaraju Sreelakshmi*, Rameshwar Sharma*: "Mutations in Tomato 1-Aminocyclopropane Carboxylic Acid Synthase2 Uncover Its Role in Development beside System II Responses" *The Plant Journal* 2021 106: 95-112.
<https://doi.org/10.1111/tpj.15148>

Selected projects (upto 5)

1. 2023-2026 Dept of Biotechnology, New Delhi project entitled "Targeted editing of light and hormone signaling for generating novel alleles regulating agronomically beneficial traits in tomato"
2. 2021-2025 Dept of Biotechnology, New Delhi project entitled "Research and Service facilities for Plant Metabolomics and Proteomics"
3. 2022-2025 Institution of Eminence (IoE)-University of Hyderabad project entitled "Targeted knockout of γ -glutamyl hydrolase1 and 2 genes to generate folate-rich tomato fruits"
4. 2020-2023 SERB, New Delhi project entitled "Genome editing of stay-green gene to enhance carotenoid content in tomato fruits"
5. 2016-2022 Dept of Biotechnology, New Delhi project entitled "Manipulation of light signaling components for improvement of tomato fruit quality", a part of CEIB on "Genome Engineering of tomato"
6. 2015-2022 Dept of Biotechnology, New Delhi project entitled "Influence of phototropin genes on tomato fruit quality and shelf life" under "Tomato ripening network"
7. 2011-2018 Dept of Biotechnology, New Delhi project entitled "Interaction between proteome and metabolome networks during tomato fruit ripening" under "Tomato metabolome network"

Selected patents (a paragraph or upto 5 bullet points)

nil

Current PhD scholars and broad research topics

Anusha Sunkum 13LPPH26 Deciphering the Proteome Dynamics of Tomato Lines altered in Carotenoid and Folate Accumulation (thesis submitted)

Vikas Singh 15LPPH01 Genome editing of phytoene synthase 1 Gene involved in Carotenoid Biosynthesis in Tomato Fruits (De-registered)

Dhanya AJ 16LPPH18 Role of E3 Ubiquitin ligase complex in the Tomato fruit development and pigment accumulation (De-registered)

Princy K 19LPPH01 Generation and characterization of targeted mutations in phototropin 2 gene of Tomato
Juvaria Raouf 20LPPH03 Targeted editing of promoters of key biosynthetic genes to enhance folate content in tomato.

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