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<https://scholar.google.co.in/citations?user=ye5GbHiyip4C&hl=en>



RESEARCH INTEREST

Plant developmental biology; Plant pathogen interaction, molecular regulations controlling seed dormancy; metabolite mapping and identifying key pathways controlling organ development and abiotic stress; role of lipids and their composition in relation to fruit senescence and seed development using functional genomics approach (genomics, transcriptomics, proteomics, metabolomics and genome editing)

POSITIONS

2021- present: Board of examination, Department of Botany, Gulbarga University, Karnataka

June 2021- Present: *Coordinator*, Department of Life sciences, central University of Karnataka

November 2019 – Present: Assistant Professor, Department of Life Science, School of Life Sciences, Central University of Karnataka

November 2019: Selected as Assistant Professor, College of Life Sciences, China Jiliang University, China (*declined, not-availed*)

April 2017 – Sep 2019: N-PDF and Post-doctoral fellow, Mentor Dr. Rajeev k Varshney, Center of Excellence in Genomics & Systems Biology, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru

June 2016 – Feb 2017: Research associate, Mentor- Prof R P Sharma, Repository of Tomato Genomics Resources (RTGR), Department of Plant Science, University of Hyderabad

EDUCATION

July 2009 – June 2016: PhD, supervisor Prof Y Shreelakshmi, Department of Plant Sciences, University of Hyderabad, Hyderabad, India

2007 – 2009: Masters in Plant Sciences from Department of Plant Science, University of Hyderabad, Hyderabad, India

2004 – 2007: Bachelors in Botany (Hons.) with Zoology and Chemistry from Banaras Hindu University, India

Number of PhD student: 2

Number of MSc student guided: 6

ACADEMIC ACHIEVEMENTS

1. 2022: Guest editor and reviewer for Frontiers, MDPI, Plant Sciences, etc.
2. Outstanding research article award by International Crops Research Institute for the Semi-Arid Tropics, India. 2021.
3. Award for publishing high impact research article, Dept. of Plant Sciences, University of Hyderabad, (2019)
4. Co-PI of an international grant, National Natural Science Foundation, China (2019)

5. Workshop & Co-PI project review meet at Shandong Academy of Agricultural Sciences, China (2018)
6. First Grant as a principle investigator” award by ICRISAT (2017)
7. DST-SERB NPDF fellowship & research grant, India (2017)
8. Indo-Israel International Fellowship, Agricultural Research Organization, Israel, not availed (2016)
9. DBT-CTEP International Travel Grant, to attend an international scientist conference in China (2013)
10. Agricultural Scientists Recruitment Board-NET, Indian Council of Agricultural Research (ICAR), India (2010)
11. GATE, IIT-Roorkee, India (2010)
12. CSIR-JRF Fellowship, India (2009)

PROJECT GRANTS

1. DST-SERB, N-PDF, New Delhi, India

Project duration: 2 years (2017-2019)

A functional genomics approach to decipher strategic modification and regulatory mechanisms involved in drought stress avoidance in groundnut

Project Budget: INR 19.2 lakhs (including scholarship)

2. Co-PI of an international grant from National Natural Science Foundation of China

Project duration: 5 years (2019-2023).

Genes/QTLs identification for late leaf spot resistance from wild Arachis species and development of marker-assisted selection techniques. 2019-2023.

Project Budget: 169.0 lakhs

3. UGC Start-up Grant (No.F.30-546/2021 (BSR))

Project duration: 2 years

Metabolomics study of leaf to capture the molecular signatures, and their association with fruit metabolic footprint in tomato novel NOR mutants

Project Budget: INR 10 lakh.

POSTERS AND ORAL PRESENTATIONS

1. *NAC-NOR* mutations in tomato Penjar accessions attenuate multiple metabolic processes and prolong the fruit shelf life. **Oral presentaion Plant Sciences colloquium-2019**, Dept. of Plant Sciences, University of Hyderabad, India
2. A functional genomics approach to decipher strategic modification and regulatory mechanisms for drought stress avoidance in groundnut. **VI NGGIBCI Conference-2017**, ICRISAT
3. Metabolic Characterization of Penjar accessions during ripening and postharvest storage. **SOL-2016**, 13th Solanaceae Conference, Davis, California, USA.
4. Metabolic analysis of tomato Delayed Fruit Deterioration (DFD) cultivars. **Plant Sciences colloquium-2014**, Dept. of Plant Sciences, University of Hyderabad, India
5. Chromoplast-specific carotenoid-associated protein appears to be important for enhanced accumulation of carotenoids in *hp1* tomato fruits. **SOL-2013**, 10th Solanaceae Conference, Beijing, China
6. Identification of natural allelic variants for *non-ripening (NOR)* gene in tomato using EcoTILLING. **SOL-2013**, 10th Solanaceae Conference, Beijing, China

7. Proteomic analysis reveals modulation of multiple metabolic pathways by *high pigment1* locus of tomato during fruit ripening, **Indo-German Symposium-2011**, Indian National Science Academy, New Delhi, India
8. Influence of DNA binding protein on tomato fruit proteome. **SOL-2009**

SPECIAL ATTAINMENTS/ TECHNOLOGY DEVELOPED

1. Discovery of a novel allele of *NAC-NOR* and new source of shelf life in fleshy fruit: **Available in public domain**. Please refer Kumar et al. 2018. doi: 10.1016/j.foodchem.2018.03.135.
2. Discovery of novel markers and regulator gene for fresh seed dormancy in groundnut: **Available in public domain**. Please refer Kumar et al. 2020. doi: 10.1111/pbi.13266.

PUBLICATIONS (33)

1. Kumar A, **Kumar R**, Shukla P, Singh S, Alam M, Singh DP. (2022) Update on cloning and molecular characterization of bacterial blight resistance genes in rice. *In, Molecular Response and Genomic Engineering for Abiotic Stress in Plants, Volume 2*. ISBN: 9780750349246
2. Mansoori A, Dubey SK, Mohan M, **Kumar R**, Singh DK, Kumar A (2022) The role of antioxidant system vis-à-vis reactive oxygen species with respect to plant–pathogen interaction. *In, Molecular Response and Genomic Engineering for Abiotic Stress in Plants, Volume 2*. ISBN: 9780750349246
3. Chauhan C, Sharma V, Thakur A, Verma SK, Tewari SK, Panwar RK, **Kumar R**, Gautam A. (2022) Understanding environmental associated biotic stress response in plants. *In, Molecular Response and Genomic Engineering for Abiotic Stress in Plants, Volume 2*. ISBN: 9780750349246
4. Sharma V, Jambaladinni K, Singh N, Mishra N, Kumar A, **Kumar R**. (2022) Understanding environmental associated abiotic stress response in plants under changing climate. *In, Molecular Response and Genetic Engineering for Stress in Plants, Volume 1*. ISBN: 9780750349192
5. Vishwakarma A, Suresh S, Kagolla P, Ramrao DP, Singh NK, Shukla P, **Kumar R**, Kumar G. (2022) Oxidative stress responses in plants to abiotic stress tolerance. *In, Molecular Response and Genetic Engineering for Stress in Plants, Volume 1*. ISBN: 9780750349192
6. Mishra N, Rana K, Seelam SD, **Kumar R**, Pandey V, Salimath BP, Agsar D (2021) Characterization and cytotoxicity of *Pseudomonas* mediated Rhamnolipids against breast cancer MDA-MB-231 cell line. *Frontiers in Bioengineering and Biotechnology Industrial Biotechnology*. **Accepted. (IF- 6.06)**
7. Singh, N; Mansoori, A; **Kumar R**; Kumar, A. (2021) Potential of Metabolomics in Plant Abiotic Stress Management. *In, Omics Technologies for Sustainable Agriculture and Global Food Security (Vol II)*. Springer International Publishing.
8. Narasanna R, Mansoori A, Mishra N, Sharma V, Thomas S, Vishwakarma A, Agsar D, Kumar A, Pandey MK, **Kumar R** (2021) Plant Metabolomics for Crop Improvement. D. Kumar Srivastava et al. (eds.), *Agricultural Biotechnology: Latest Research and trends*. eBook ISBN: 978-981-16-2339-4. 10.1007/978-981-16-2339-4
9. Singh, N., Mansoori, A., Jiwani, G., Solanke, A. U., Thakur, T. K., **Kumar R**, ... & Kumar, A. (2021). Antioxidant and Antimicrobial Study of *Schefflera vinosa* Leaves Crude Extracts Against Rice Pathogens. *Arabian Journal of Chemistry*, 103243. **(IF- 6.21)**

10. Parmar, S., Deshmukh, D. B., **Kumar, R.**, et al. (2021). Single Seed-Based High-Throughput Genotyping and Rapid Generation Advancement for Accelerated Groundnut Genetics and Breeding Research. *Agronomy*, 11(6), 1226. (IF- 3.99)
11. **Kumar R.**, et al., Genome Editing Technologies for Plant Improvement: Advances, Applications and Challenges. In *Omics technologies for sustainable agriculture and global food security (Vol-1)*. [10.1007/978-981-16-0831-5](https://doi.org/10.1007/978-981-16-0831-5) Springer Nature, eBook ISBN: 978-981-16-0831-5
12. Bhogireddy S, Mangrauthia SK; **Kumar R.**, et al., (2021) Regulatory non-coding RNAs: A new frontier in regulation of plant biology. *Functional & Integrative Genomics* (IF- 3.67)
13. Singh N, Mansoori A, Jiwani G, Solanke AU, **Kumar R.**, Kumar A. (2021) Evaluation of antioxidant and antimicrobial potential of *Thespesia lampas* root extracts. *Journal of Experimental Biology and Agricultural Sciences*. 9(1), 87 – 99.
14. Thomas S, **Kumar R.**, et al., (2021) iTRAQ-based proteome profiling revealed the role of PhyA in regulating primary metabolism in tomato seedling. *Scientific Reports* 11:7540 (IF- 4.99)
15. **Kumar R***, Sharma V, Suryavanshi SS, Ramrao DP, et al, (2021) Understanding Omics Driven Plant Improvement and De-Novo Crop Domestication: Some Examples. *Frontiers in Genetics* 12:637141. (IF- 5.6)
16. Sharma V, Gupta P, Kagolla P, SharanKumar, BhagyaShree, Veershetty A, Ramrao DP, Suryavanshi SS,..... **Kumar R*** (2021) Metabolomics Intervention Towards Better Trait Understanding in Plants. *Cells* 10(2), 346 (IF- 7.67)
17. Nayak S, Hebbal V, Soni P, **Kumar R.**, et al. (2021) Groundnut Kernel Transcriptome. In: Cifuentes, A. (Ed.), *Comprehensive Foodomics*, vol. 1. Elsevier, pp. 528–543. <https://linkinghub.elsevier.com/retrieve/pii/B9780081005965227467>
18. Kumar A, **Kumar R.**, Singh N, Mansoori A. (2020) Regulatory Framework and Policy Decisions for Genome-Edited Crops. In: Bhattacharya A, Parkhi V, Char B. (eds) *CRISPR/Cas Genome Editing. Concepts and Strategies in Plant Sciences*. Springer, Cham. https://doi.org/10.1007/978-3-030-42022-2_9
19. Soni P, Nayak SN, **Kumar R.**, et. al., (2020) Transcriptome Analysis Identified Coordinated Control of Key Pathways Regulating Cellular Physiology and Metabolism upon *Aspergillus flavus* Infection Resulting in Reduced Aflatoxin Production in Groundnut. *Journal of Fungi*. 2020; 6(4):370. (IF- 5.72)
20. Kumar A, **Kumar R.**, Sengupta D, et al. (2020) Deployment of genetic and genomic tools towards gaining a better understanding of Rice-Xanthomonas oryzae pv. oryzae interactions for development of durable bacterial blight resistant rice. *Frontiers in Plant Sciences* <https://doi.org/10.3389/fpls.2020.01152> (IF- 6.63)
21. **Kumar R.**, et al. (2020) QTL-seq identified candidate genes and molecular markers for fresh seed dormancy in groundnut. *Plant Biotechnology Journal* 18, 992–1003 (IF- 13.36)
22. MK, Pandey AK, **Kumar R.**, e al. 2020. Translational genomics for achieving higher genetic gains in groundnut. *Theoretical and Applied Genetics*. 133, 1679–1702 (IF- 5.59)
23. Soni P, Gamgurde S, Ortega-Beltran A, **Kumar R.**, et al. (2020) Functional biology and molecular mechanisms of host-pathogen interaction for aflatoxin contamination in groundnut

(*Arachis hypogaea* L.) and maize (*Zea mays* L.). *Frontiers in Microbiology* doi: 10.3389/fmicb.2020.00227 (IF- 6.06)

24. Sharma V, Bhattacharyya S, **Kumar R**, et al. (2020) Molecular basis of root nodule symbiosis between *Bradyrhizobium* and ‘Crack-Entry’ legume groundnut (*Arachis hypogaea* L.). *Plants* 9, 276 (IF- 4.6)
25. **Kumar R**, et al. (2019) Peg Biology: deciphering the molecular regulations involved during peg development. *Frontiers in Plant Science*. 10, 1289 (IF- 5.07)
26. Pandey MK, **Kumar R**, et al. (2019) Mitigating Aflatoxin Contamination in Groundnut through A Combination of Genetic Resistance and Post-Harvest Management Practices *Toxin* 11, 315 (IF- 4.6)
27. Gangurde SS, **Kumar R**, et al. (2019) Climate-smart groundnuts for achieving high productivity and improved quality: current status, challenges, and opportunities. In, genomic designing of climate-smart oilseed crops. Springer International Publishing. Pages 133-172 DOI:10.1007/978-3-319-93536-2_3
28. Progress in understanding drought tolerance: from alleles to cropping systems. (2018) *Journal of experimental Botany* 69(13), 3175–3179 **Acknowledged by editor for assisting help in editing of a special issue. (IF- 5.91)**
29. Sehgal A, Sita K, Siddique KH, **Kumar R** et al. (2018) Drought or/and Heat-Stress Effects on seed filling in food crops: impacts on functional biochemistry, seed yields, and nutritional quality. *Frontiers in Plant Sciences* 9,1705 (IF- 6.33)
30. **Kumar R**, Tamboli V, Sharma R, Sreelakshmi Y (2018) *NAC-NOR* mutations in tomato Penjar accessions attenuate multiple metabolic processes and prolong the fruit shelf life. *Food Chemistry* 259, 234–244 (IF- 9.23).
31. **Kumar R**, Bohra A, Pandey A, Pandey M, Kumar A (2017) Metabolomics for plant improvement: Status and prospects. *Frontiers in Plant Science* 8, 1302 (IF- 6.66).
32. Mohan V, Gupta S, Thomas S, Mickey H, Charakana C, Chauhan V, Sharma K, **Kumar R**, et al. (2015) Tomato fruits show wide phenomic diversity but fruit developmental genes show low genomic diversity. *PLoS ONE* 11(4), e0152907 (IF- 3.66)
33. Kilambi HV, **Kumar R**, Sharma R, Sreelakshmi Y (2013) Chromoplast-specific carotenoid-associated protein appears to be important for enhanced accumulation of carotenoids in hp1 tomato fruits. *Plant Physiology* 161(4), 2085-101 (IF- 8.4)

International Books Published

1. Anirudh Kumar, **Rakesh Kumar**, Pawan Shukla, Manish K Pandey- *Editors, Omics technologies for sustainable agriculture and global food security (Vol-1)*. [10.1007/978-981-16-0831-5](https://doi.org/10.1007/978-981-16-0831-5) **Springer Nature**, eBook ISBN: 978-981-16-0831-5
2. Anirudh Kumar, **Rakesh Kumar**, Pawan Shukla, Hitendra K Patel- *Editors, Omics technologies for sustainable agriculture and global food security (Vol-II)*. **Springer Nature**, eBook ISBN: 9811629552
3. Pawan Shukla, Anirudh Kumar, **Rakesh Kumar**, Manish K Pandey *Molecular Response and Genetic Engineering for Abiotic Stress in Plants (Vol- 1)*. **IOP science Publications** Online ISBN: 978-0-7503-4921-5

4. Pawan Shukla, Anirudh Kumar, **Rakesh Kumar**, Manish K Pandey *Editors*, *Molecular Response and Genetic Engineering for Abiotic Stress in Plants (Vol- II)*. **IOP science Publications** Online
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