

## Dr. Rakesh Kumar

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



### RESEARCH INTEREST

Plant developmental biology; 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

**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:** Visiting scientist, Center of Excellence in Genomics & Systems Biology, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru

**June 2016 – Feb 2017:** Research associate, Repository of Tomato Genomics Resources (RTGR), Department of Plant Science, University of Hyderabad

### EDUCATION

**July 2009 – June 2016:** PhD in Plant Sciences from Department of Plant Science, 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

### ACADEMIC ACHIEVEMENTS

1. Award for publishing high impact research article, Dept. of Plant Sciences, University of Hyderabad, (2019)
2. Co-PI of an international grant, National Natural Science Foundation, China (2019)
3. Workshop & Co-PI project review meet at Shandong Academy of Agricultural Sciences, China (2018)
4. First Grant as a principle investigator” award by ICRISAT (2017)
5. DST-SERB NPDF fellowship & research grant, India (2017)
6. Indo-Israel International Fellowship, Agricultural Research Organization, Israel, *not availed* (2016)
7. DBT-CTEP International Travel Grant, to attend an international scientist conference in China (2013)

8. Agricultural Scientists Recruitment Board-NET, Indian Council of Agricultural Research (ICAR), India (2010)
9. GATE, IIT-Roorkee, India (2010)
10. CSIR-JRF Fellowship, India (2009)

### **PROJECT GRANTS**

1. DST-SERB, 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

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

### **POSTERS AND ORAL PRESENTATIONS**

1. *NAC-NOR* mutations in tomato Penjar accessions attenuate multiple metabolic processes and prolong the fruit shelf life. **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**, 13<sup>th</sup> 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 *hpl* tomato fruits. **SOL-2013**, 10<sup>th</sup> Solanaceae Conference, Beijing, China
6. Identification of natural allelic variants for *non-ripening* (*NOR*) gene in tomato using EcoTILLING. **SOL-2013**, 10<sup>th</sup> 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**

1. 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 **(5 yr IF- 6.84)**
2. 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 **(5 yr IF- 4.3)**
3. 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 **(5 yr IF- 2.63)**
4. Nayak S, Hebbal V, Soni P, Kumar R, et al. (2019) Groundnut kernel transcriptome. In, Reference Module in Food Science, Elsevier. <https://linkinghub.elsevier.com/retrieve/pii/B9780081005965227467>
5. Kumar R, et al. (2019) Peg Biology: deciphering the molecular regulations involved during peg development. *Frontiers in Plant Science*. 10, 1289 **(5 yr IF- 4.1)**
6. 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 **(5 yr IF- 4.01)**
7. 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
8. 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. (5 yr IF- 6.30)**
9. 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 **(5 yr IF- 4.3)**
10. 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 **(5 yr IF- 5.49)**.
11. Kumar R, Bohra A, Pandey A, Pandey M, Kumar A (2017) Metabolomics for plant improvement: Status and prospects. *Frontiers in Plant Science* 8, 1302 **(5 yr IF- 4.86)**.
12. 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 **(5 yr IF- 3.34)**
13. 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 **(5 yr IF- 7.02)**