

Profile of Scientist



- 1. Name of the Scientist** : **Dr. Divya Balakrishnan**
Email Id: Divya.Balakrishnan@icar.gov.in
Phone: +914024591322
- 2. Personal Bio-data** :
- a) Position/Designation** : Scientist (Sr.Scale)
b) Joining date in ICAR : 02.07.2012
c) Discipline and Specialization : PhD (Plant Breeding and Genetics)
d) Training/advance exposure in the area of work:

- Training on “Capacity building for intellectual Property protection and technology licensing in Agriculture under Indo US agricultural Knowledge initiative” jointly organized by Haryana Agricultural university, ICAR & Michigan state university, USA at Kerala Agricultural University, Thrissur.
- Training cum awareness programme on Protection of plant varieties and farmer’s rights held at the department of PGR, TNAU, Coimbatore
- Attachment Training on Marker assisted selection of gene pyramided lines for multiple resistance to biotic and abiotic stresses in Rice” at CRRRI, Cuttack on 18th february, 2013.
- Training on Water management and water saving technologies in rice, 30th October to 8th November 2012 DRR, Hyderabad.
- ICAR sponsored 21 days Winter school on “Molecular breeding approaches for genetic enhancement of millet crops” during 06-26 january,2014 at Directorate of Sorghum Research, Hyderabad.
- ICAR Sponsored 21 days Winter School on “New Frontiers in Rice Breeding for Improving Yield, Quality and Stress Tolerance for Sustaining Future Production” during September 10-30, 2014 at Directorate of Rice Research, Hyderabad.
- Training Programme on “Analysis of Experimental Data” during 10-15 November 2014 at ICAR- National Academy of Agricultural Research Management, Hyderabad.
- Short training course on “Widening the Genetic base in Rice through Pre-Breeding Efforts for Developing Next Generation Varieties and Hybrids” on 19-28 January 2015 at DRR Hyderabad.
- Training workshop on “Monitoring of Confined Field Trials of Regulated GE Plants” organized by MoEFC, DBT and ILSI foundation on 3-4 June 2015 at NAARM, Hyderabad, India.

- Short Training Course on “Quality Improvement, Bio-fortification and Product Development in Rice for Nutritional and Financial Security of Rice Farmers” during September 01-10, 2015; at ICAR-Indian Institute of Rice Research, Hyderabad.
- INSA_DST_JSPS post doctoral fellowship under Indo-Japanese Joint Project on "Establishment of Young Researcher Fellowship Programme 2018-2019"

e) Contribution to the scientific advancement :

- Marker Assisted Back Cross Breeding to Introgress Blast (*Pyricularia Oryzae*) Resistance Genes into the Susceptible Rice (*Oryza Sativa L.*) Varieties ADT43, BPT5204 and Improved White Ponni and identified four genes (Pi1, Pi2 Pi33 and Pi54) pyramided lines which were highly resistant to the blast pathogen at two epiphytotic locations; Coimbatore and Gudalur with significant similarity to ADT43 in morphological, yield and grain quality traits.
- Development of CSSLs using wild introgression in cultivar back ground in the following crosses MTU1010 x *O. rufipogon* CR 100267, Swarna x *O. rufipogon* CR 100267, Swarna x *O.nivara* IRGC81848 BILs, Swarna x *O.nivara* IRGC81832. These lines would serve as a national resource for basic research to map any trait with a special focus is on mapping yield related traits.
- Development of mapping populations from advanced back cross introgression lines and detection of yield QTLs in wild introgression lines. Identification high yielding stable introgression lines through Genotype by environment analysis
- Identification of potential wild introgression lines with tolerance to various biotic and abiotic stresses, high photosynthetic rate, seedling vigour traits

3. Future Planning of research:

- Development of chromosome segment substitution lines of rice from elite x wild crosses to map QTLs/genes for yield traits under ICAR National Professor Project as CO PI
- Identification of novel Genes/ QTLs for Yield Contributing Traits explore Wild Introgression Lines and Mutants under institute project ABR/CI/BR/28 as PI
- Exploring Chromosome Segment Substitution Lines from inter-specific crosses to decipher the genetics of grain weight and earliness under , DBT BioCARE project as PI
- Exploring genetic architecture of biotic stress resistance in Chromosome segment substitution lines under, Indo-Japanese Joint Project on "Establishment of Young Researcher Fellowship Programme 2018-2019" as INSA_DST_JSPS post doctoral fellow
- QTL mapping for heat tolerance using wild introgression lines under National Initiative for Climate Resilient Agriculture (NICRA) as CO PI
- Genotype x environment interaction studies of mutants and generation of mapping population from N22 mutants and mapping the tolerance to Low P under N22 phase II project as CO PI

4. Publications (best five) :

- Divya Balakrishnan, Malathi S, Sukumar M and Sarla N. 2018. Development and use of chromosome segment substitution lines as a genetic resource for crop improvement. *Theoretical and Applied Genetics* . DOI: 10.1007/s00122-018-3219-y.

- Divya Balakrishnan, D Subrahmanyam, Jyothi B, AK Raju, YV Rao, B.Kavitha, S Mesapogu, M Surapaneni, Revathi P, Padmavathi G, , Ravindra Babu V and N Sarla. 2016. Genotype × environment interactions of yield traits in backcross introgression lines derived from *Oryza sativa* cv. Swarna /*Oryza nivara*. *Frontiers in plant science*. 19;7:1530. 10.3389/fpls.2016.01530.
- Divya Balakrishnan, S. Robin, R. Rabindran, S. Senthil, M. Raveendran and A. John Joel. 2014. Marker assisted backcross breeding approach to improve blast resistance in Indian rice (*Oryza sativa*) variety ADT43. *Euphytica*. *Euphytica* 200: 61–77.
- Malathi S, Divya Balakrishnan, Sukumar M, A Krishnamraju Y V Rao and Sarla N. 2017. Identification of Major Effect QTLs for Agronomic Traits and CSSLs in Rice from Swarna/*Oryza nivara* Derived Backcross Inbred Lines. *Frontiers in plant science*., 22 June 2017 | <https://doi.org/10.3389/fpls.2017.01027>.
- Poli Y, Divya Balakrishnan, S Desiraju, M Panigrahy, S R Voleti, S K Mangrauthia and Sarla N. 2018. Genotype × Environment interactions of Nagina22 rice mutants for yield traits under low phosphorus, water limited and normal irrigated conditions. *Scientific reports*. 2018 8:15530 DOI:10.1038/s41598-018-33812-1 https://www.researchgate.net/profile/Divya_Balakrishnan6 <https://scholar.google.co.in/citations?user=NF-DvCoAAAAJ&hl=en>

5. Other relevant activities of Scientist:

- Life member of Indian Society of Plant Breeders (ISPB), TNAU, Coimbatore
- Life member of AAPMHE,IIHR, Bangalore
- Life member of Society for Advancement of Rice Research, IIRR, Hyderabad
- Life member of Society for Scientific Development in Agriculture and Technology, Meerut, U.P. India
- Member of ARROWRYZA, CRRI, Cuttack
- Member of the ISGPB, IARI, New Delhi.
- Coordinator for Modern Integrated Crop Breeding Tools -Breeding Management System, 18 Jan 2016 to 27
- Jan 2016 Organized by ICAR -Indian Institute of Rice Research, Rajendranagar, Hyderabad, 500 030.
- Coordinator for 10 days ICAR Short course on Prebreeding using wild species for sustainable yield in crops
- Jan 2017 by Organized by ICAR -Indian Institute of Rice Research, Rajendranagar, Hyderabad, 500 030.
- Coordinator for HRD Training on Molecular breeding techniques for crop improvement for 28days (21-7-2017 to 17-8-2017) at the ICAR-Indian Institute of Rice Research, Hyderabad.
- Resource person for CAFT in GPB - Training on “Application of molecular markers in crop breeding “by TNAU, Coimbatore during 22 November to 12 December 2018
- Resource person for Traditional and modern breeding approaches for development of high quality rice varieties. ICAR-IIRR, Hyderabad,25 October 2018 to 19 January 2019
- Co chairman for M.Sc. and PhD students