Curriculum Vitae

Dr. MAGANTI SHESHU MADHAV

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Research Experience: 25 years' experience in Plant Molecular biology, Biotechnology, anduse of Molecular genetics tools in breeding (Rice, Tobacco and Citrus).

Educational qualifications

Postdoctoral research	Dr. G.L. Wang's Lab at **The Ohio State University, Columbus,Ohio, USA**
Ph.D. (Molecular Biology and Biotechnology)	National research Centre on plant Biotechnology (NRCPB), **Indian** Agricultural Research Institute **(IARI), New Delhi,**India
M. Sc (Agricultural Biotechnology)	Assam Agricultural University, Jorhat**,Assam**, India
B. Sc (Agriculture) -	A.P, Agricultural University, **Hyderabad,** India

Details of Employment

November 11, 2022 - Till date	**Director,** ICAR- National Institute for Research on Commercial Agriculture, RJY, A.P., India
April 2014 – November10, 2022	**Principal Scientist**- Biotechnology, ICAR-IIRR, Hyderabad, Telangana, India.
Sep 2007- Mar 2014	**Senior Scientist**, Biotechnology, Directorate ofRice research (DRR), Hyderabad,
Feb 2005 -August 2006	**Scientist** (Sr. Scale), Central Tobacco Research Institute (ICAR-CTRI)
August 2001 -Feb 2005	**Scientist**, (NRCPB) Indian AgriculturalResearch Institute, Delhi, India
April 1999- July 2001	**Scientist**, Central Tobacco Research Institute(ICAR-CTRI), Rajahmundry, A.P.

External funded Research projects (completed): 22

Technology developed:

- **Dominant Rice blast resistance gene *Pikh (Pi54*) mapped and cloned fromTetep** and submitted to Genbank (**first gene to be cloned by map based cloning in India).** This gene is being used in several molecular breeding programmes extensively by various research groups for rice improvement. **This work is cited by 271 times, NCBI** Genbank accession number: AY914077
- **Developed the variety DRR Dhan-51** (IET25484), which is a Near Isogenic line (NIL) of Swarna having *Pi2* (rice blast resistance gene) through Marker Assisted Backcross Breeding strategy (MABB). This variety released through Central Variety Release Committee (CVRC) and recommended for states of Telangana, Uttar Pradesh, Chhattisgarh and Gujarat.
- **Developed the variety DRR Dhan-55** (IET26194), which is a long bold grain typewith leaf blast resistance variety, exhibited superior yield performance over the best varietal check under aerobic system of cultivation. This variety released through CVRC and recommended for states of Bihar and Chhattisgarh**.**
- **Developed the Variety DRR Dhan 57:** Derived from BPT having medium slendergrain with leaf and neck blast resistance suitable for aerobic system of cultivation. This variety released through CVRC and recommended for states of Chhattisgarhand Jharkhand
- **Developed the variety DRR Dhan-60,** is developed though MABB having BLB resistance genes with phosphorus use efficiency gene (Pup1). This variety released through CVRC recommded for Andhra Pradesh, Telangana, Tamil Nadu, Karnataka , Jharkhand, Odisha, Chhattisgarh, Maharashtra, Gujarat and Bihar.
- **Developed the Variety DRR Dhan 62:** It is a Near Isogenic line (NIL) of Improved Samba Mahsuri having ***Pi2+ Pi54*** (rice blast resistance genes) through Marker Assisted Backcross Breeding strategy (MABB). This variety released through CVRC and recommended for states of Telangana, Karnataka and Chhattisgarh.
- **Developer for the variety, DRR Dhan 63** which has overall high mean Zinc (24.2ppm) in polished rice with high yields (6.0t/ha). It has moderate resistance to leaf blast and BLB among diseases and planthoppers among insects. This variety released through CVRC and recommended for states of UP, Odisha and Kerala.
- **Developed the Transgenic lines having amiRNAs** (artificial miRNAs) designed from three key genes of Yellow stem borer.
- **Developed unique line for leaf and neck blast resistance**, it is introgression line developed using *Oryza glumepautula* **(IL-31), registered at NBPGR as INGR15002**
- Identified novel alleles of ***Pi54, Pib and Pita*** **(**three important blast resistance genes of India) from wild *Oryza* species and landraces through PCR based allele mining strategy in NCBI. **These alleles can be used for development of durable blast resistance inrice.**
- **Developed a unique line for sheath blight tolerance,** it is a stabilized mutant line (ShB-1) of samba Mahsuri, shown resistance to diverse virulent isolates of sheath blight as well as hotspot locations of India, ***registered at NBPGR asINGR20080***
- **Developed unique line having Strong culm.** This is stabilized mutant line of Samba Mahsuri, shown strong culm in anatomical and histological analysis performed by scanning electron microscope***, registered at NBPGR as INGR 20079***
- **Developed three unique lines** having resistance for Brown Plant Hopper (BPH) and White Backed Plant Hopper (WBPH) at vegetative and reproductive stages. They are a RILs derived from the PTB 33 (resistant source), Sinnasivappu (resistant source) and MO1 (resistant source). All these lines are being used in breeding programme of BPH. Registered ***with NBPGR as*** **INGR16001, *INGR17066 and INGR19003***
- **Developed the near isogenic line of Improved Samba Mahsuri (ISM)** having *Pi54* (blast resistance gene) through MABB. *This line is being used as donor for Pi54 for all MAs programme since it is in good background.* ***Registered with NBPGR as INGR18001***
- **Developed a unique line** (RP 5972-13-1-6-67-129-266) having phosphorous uptake (PUP1) in the genetic background of elite cultivar, MTU1010 by MABB. This line is being used as donor for PUP1 for all MAS programmes since it is in good background. **Registered with NBPGR as INGR19036**
- **Cloned a novel blast resistant gene *Pi68(t)*** from *O. glumeapetula,* which confers leaf and neck blast resistance. Three susceptible alleles were also cloned. *This gene code for Malectin-serine threonine kinase.* ***(First gene having resistance for both phases of rice blast cloned in India),*** **NCBI Genbank accessions numbers are:** MG742320, MG742321 MG742322, MG742323
- Developed **functional marker for Aroma, Kernel length after cooking (KLAC)** which **can distinguish fragrant from non-fragrant rice varieties** and can be usefulfor identification of impurities in seed-lots and grain-lots of Basmati varieties. ***These markers are being used extensively by various research groups.***
- **Cloned three key genes** (Acetyl cholinesterase, Cytochrome P450 (CYP6AE14) and Amino Peptidase N) from **Yellow stem borer**, a serious pest of rice and sequences were deposited in NCBI, **NCBI Genbank submissions:** KC904274, KF955557, KF290773.
- ***Genome of major insect pest, Yellow Stem Borer of rice*** has been sequenced and submitted in Genbank, ***this is the first sequence report in the international level, NCBI accession: JAIRBL010000000, GCA_020086525.1***
- **Developed a novel-functional marker-based multiplex-PCR assay** targeting the candidate gene for WA-CMS trait (i.e. ORF126) and the candidate for the major fertility restoration in rice (i.e. *Rf4*). The marker system has been found to be **highly useful for detection of impurities in seed-lots of WA-CMS lines and rice hybrids.**
- **Identified markers for major cooking quality traits** like amylose content, gelconsistency, gelatinization temperature etc. for *indica* rice
- **Identified tolerant Samba Mahsuri mutant lines for Yellow stem borer (YSB),** four *mutants showed high level of tolerance, which will have greater significance in the rice improvement programme.*
- **Identified functional marker** targeting sugar translocation and transporter genes associatedwith grain filling of rice.
- **Identified novel set of reference genes for expression studies under aerobic conditions.** *This is the first report on identification of stable genes in aerobic conditions*

- **Identified a resistance gene i.e *Pi 68* conferring resistance for vegetative and reproductive stage**
- **Developed the phenotyping method for stigma exsertion trait in rice.**
- I was part of the research team who successfully introgressed **the 2-3 BLB genes and 2-3 blast genes** in the back ground of varieties like Akshayadhan, Sampada, Tella Hamsa and JGL 1794 **and hybrid parental lines like maintainer lines (DRR17 B, APMS 6B, IR58025B) and restorer lines (RPHR- 1005,KMR 3R) through MABC.** All these lines are pre breeding materials forcrop Improvement.
- **Developed 73 nuclear SSR markers, 10 cpSSRs and 10 Mt SSRs,** which are being used regularly by all tobacco researchers for mapping and tagging important genes in **tobacco.**

Awards/Honors

- ***ICAR-Outstanding inter-Disciplinary Team Research in Agriculuture, Agriculture Extension, Extension and Allied Sciences 2025***
- ***Fellow of National Academy of Agricultural Sciences (NAAS) from 2024***
- ***Fellow of ISTS from 2021-22***
- ***Fellow of Royal Society of Biology (FRSB), London, UK from 2020***
- ***Fellow of Rice Association (FRA) in 2019***
- ***Fellow of Telangana Science Academy (TAS) in 2019***
- ***Fellow of Association of Biotechnology and pharmacy, India***
- Awarded "**Best Senior scientist-2016"** from ***Association of Biotechnology and Pharmacy*** for Outstanding work on Plant Biotechnology.
- Rythu Nestham recognition Award for the best scientist category in 2020
- Awarded **"Lal Bahadur Shastri Young Scientist Award** "for outstanding agricultural Biotechnology research 2012" ***from ICAR, Govt. of India***
- Awarded **"Distinguished Scientist Award-2016"** for outstanding contributions in the field of biotechnology from Science and technology, Society for integrated rural improvement, India
- Awarded first **" SVS shastry best scientist award from IIRR** in 2015"
- Awarded **"Distinguished Scientist Award"** for outstanding rice biotechnology research, 2014 from Astha foundation, India
- Selected as Associate Fellow of National Academy of Agricultural sciences(NAAS)- 2013
- Recipient of **CSIR best S&T innovation for rural development Award** for the team for the popularization of Improved Samba Mahsuri, 2013.
- Awarded "Best young scientist-2013" from *Association of Biotechnology andPharmacy* for outstanding work on Plant Biotechnology
- Awarded **"Jawaharlal Nehru Award** for outstanding postgraduate agricultural research 2006" ***from ICAR, Govt. of India***
- Awarded **"BOYSCAST fellowship** (Better opportunities for the young scientist in chosen areas of science and technology)" in 2007 from DST, Govt. of India.
- **Selected as Best International research scholar award** at Ohio state University (OSU) in 2009
- DBT Junior Research Fellowship for M. Sc. – 1995 to 1997
- Qualified "National Eligibility Test" for Lectureship and Assistant Professor, conducted by ICAR, New Delhi, October-1997
- CSIR Junior Research Fellowship for Ph. D – 2001-2002
- First rank in All India Entrance Exam for Ph.D. (Plant science) Admission at HCU-1999
- IARI Senior Research Fellowship for Ph. D - Sep.2002 to Jan 2005
- **Academic editor of PLOS ONE, BMC plant Biology, Annals of Genetics from 2019**

No. of PhD(s) and MPhil(s) guided: 12 students awarded for Ph.D., 2 are registered (yet to award). 13 students awarded for M.Sc

Publications Summary

PUBLICATIONS - 195, International Journals: 115; National Journals: 80
Citations (Google scholar, July, 2025) – 4944; H-Index: 37, I-10 Index: 107 ,
E-Publications: 89 (Genes and other GenBank submissions) Genomes sequenced -2, Technical Bulletins 44
Books and Book chapters contributed: 21

Patents filled/DNA sequence deposited in Genbank:

- *Pik*^{h} gene and cDNA sequence submitted to Genbank: The annotated genomic DNA and the cDNA of Pi kh gene were submitted to the genbank. Accession number: AY 914077
- Microsatellite clones of tobacco: The 70 genomic clones containing the unique microsatellite motifs submitted at Genbank. EF 375958 to EF 375992 (34 sequences) ACC numbers: DQ 865407 to DQ865439 (36 sequences) ACC numbers: DQ 865407 to DQ865439
- Ten alleles including their native promoters of major blast resistance genes *Pi K*^{h}, *Pita* and three promoter alleles of bacterial leaf blight (BLB) genes *Xa21*, *xa5* and *xa13* genes were cloned from land races and different species of *Oryza*. These sequences have been submitted in genbank – NCBI (ACC numbers: GU258499-GU258508, GU269201-GU269204).

Membership of National Committees/ Professional Bodies:

i) Member ICAR General Body from 2023
ii) Chairman of BIS (Bureau of Indian Standards) committee on " FAD 04 Sectional Committee
iii) Member of Tobacco Board, 2022
iv) Member of ICAR Governing Body from Nov 2022
v) Board of Management (ICAR Nominee) – ANGRAU 2022-23
vi) President Indian Society of Tobacco Research (ISTS)
vii) Life Member of Indian Society of Biochemistry and Biotechnology
viii) Life Member of Association of DNA technology (ADNAT)
ix) Life member of Association of Biotechnology and Pharmacy (ABAP)

Synergistic Activities

In addition to research activities, I'm involved in the National Turmeric Board for turmeric development and in the Spice Board for export promotion of chilli.

Collaborators and Other Affiliations

Collaborators and co-editors – Dr. GL. Wang, OSU, USA, Dr, KK Jena IRRI-Korea, ,Dr, T. Mohapatra, Dr. N.K, Singh, IARI, Dr A.K. Singh, Genetics, IARI, Dr. R .K. Varsheney, ICRISAT, Dr. P. B. Kirti, Dr P. Appa Rao, University of Hyderabad, Dr. Ramesh Sonti, ICGEB,, Dr. Parminder Virk, IRRI, Manila.