

## *Curriculum Vitae*

***Lalit Laxman Kharbikar***

**A scientist at Indian Council of Agricultural Research**

**(Total Research Experience: 16 Years)**



### **Personal information**

*Nationality: Indian, Marital status: Married, Date of birth: 23<sup>rd</sup> November 1977, English, Hindi, Marathi, Halbi, Chattisgarhi and Bengali, spoken.  
Passport Number: G4967001*

### **Education**

***Ph.D. (Biotechnology) Expected February 2019. RTM Nagpur University, Nagpur, 440 033, INDIA in collaboration with Harper Adams University, Newport, Shropshire, TF10 8NB, UNITED KINGDOM.***

***Title of Ph.D. thesis: Identification of microRNA like RNAs in Fusarium graminearum and exploring their interactions with wheat genome using bioinformatics tools.***

***M.Phil. (Molecular Diagnostics) October 2010 – October 2013. Harper Adams University, Newport, Shropshire, TF10 8NB, UNITED KINGDOM.***

***Title of M.Phil. thesis: Impact of Post-anthesis Rainfall on the Production and Distribution of Fusarium Mycotoxins in Wheat.***

***M.Sc. (Agriculture), September 2000 - September 2003. Department of Biotechnology, Indira Gandhi Krishi Vishwa Vidyalaya, Raipur, Chattisgarh, 492012, INDIA.***

***Title of M.Sc. (Ag.) thesis: DNA Fingerprinting and Biochemical Characterization of Genetic Diversity in Cultivated Cotton (Gossypium spp.). (grade 7.14/10.0).***

***BSc (Agriculture), August 1996 - July 2000. Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, Maharashtra, 444400, INDIA.***

***(grade 7.53/10.0 College of Agriculture, Nagpur).***

***B.Sc. (Ag.) Life Science Courses: Genetics & Plant Breeding, Biochemistry, Microbiology, Plant Pathology, Entomology and Plant Physiology***

### **Scientific contributions**

- 1. Developed a loop-mediated isothermal amplification (LAMP) protocol as a low-cost alternative to PCR for rapid detection of mesta yellow vein mosaic virus (MeYVMV) in the field.***
- 2. Introduced the naturally occurring sand as a new, easily available and more importantly, a cheap material for disruption of Arthrobacter spp. and Aspergillus niger for the extraction of total RNA.***

3. First time reported the significantly increased Zearalenone (ZON) production by *Fusarium graminearum* in wheat and its mill fractions, due to longer humidity periods during anthesis, post-anthesis rainfall and delayed wet harvest.
4. Identified two Wheat Transcripts Responsive to *Bipolaris* (WTRBs), which were significantly altered due to *B. sorokiniana* infection in wheat. Both WTRB-1 and WTRB-2 may be used as molecular markers for screening wheat lines for spot blotch resistance.
5. Isolated herbicides (glyphosate + paraquat and paraquat) degrading *Aspergillus niger* isolates viz., CRIJAF/GPT 2510 and CRIJAF/PT from Jute (*Corchorus* spp.) rhizosphere.
6. Identified a URP-2R molecular marker (derived from Universal Rice Primers), to differentiate *Chaetomium globosum* (a potential antagonist of fungal plant pathogens) from other species.
7. Identified 15 stable QTLs (7 for days to 50% flowering, 2 for plant height, 1 each for grain breadth and panicle length, and 4 for grain L/B ratio) in the double-haploid (DH) mapping population of rice.

## Publications

### In Refereed Journals:

1. Edwards, S.G, **Kharbikar, L.L.**, Dickin, E.T., McDonald, S. and Scudamore, K.A. 2018. Impact of pre-harvest rainfall on the distribution of fusarium mycotoxins in wheat mill fractions. **Food Control**, doi.org/10.1016/j.foodcont.2018.02.009.
2. **Kharbikar, L.L.**, Dickin, E.T. and Edwards, S.G. 2015. Effect of water regimes, fungicide and harvesting time on the concentration of deoxynivalenol and zearalenone in wheat. **Food Additives & Contaminants: Part A**, 32 (12): 2075-2085. doi:10.1080/19440049.2015.1084652.
3. **Kharbikar, L.L.** and Majumdar, B. 2015. A low cost disruption of rhizospheric microorganisms for the extraction of total RNA using modified RNeasy Mini Kit protocols. **Annals of Microbiology**, 65(3): 1797-1801. doi:10.1007/s13213-015-1052-y.
4. **Kharbikar L.** and Karmakar, P.G. 2014. Understanding the interactions between plant biotic and abiotic stress through characterization of microRNA effectors in jute (*Corchorus* spp.)–*Macrophomina phaseolina* interaction system. **New Biotechnology**, 31(July), S57. doi:10.1016/j.nbt.2014.05.1743.
5. **Kharbikar L.L.**, Dongre A.B., and Dangat S. 2013. Particle Bombardment: Not a Good Approach for Gene Transfer into Embryonic Axes of Cotton (*Gossypium hirsutum* L.) Cultivars. **WebmedCentral BIOTECH.**, (8):WMC004305.
6. Rashmi Aggarwal, **Lalit L. Kharbikar**, Sapna Sharma and Sangeeta Gupta. 2013. Phylogenetic relationships of *Chaetomium* isolates based on the internal transcribed spacer region of the rRNA gene cluster. **African Journal of Biotechnology**, 12(9): 914-920.
7. R. Aggarwal, S. Purwar, **L. L. Kharbikar** and Sangeeta Gupta. 2011. Induction of a Wheat  $\beta$  1,3-Glucanase Gene During the Defense Response to *Bipolaris sorokiniana*. **Acta Phytopathologica et Entomologica Hungarica**, 46(1):39–47.
8. Rashmi Aggarwal, **Lalit L. Kharbikar** and Renu. 2011. Identification of *Bipolaris sorokiniana*-responsive differential transcripts in wheat (*Triticum aestivum* L.). **Indian Phytopathology**, 64(1):24-27.

9. D. Sarkar, M.K. Sinha, A. Kundu, C.S. Kar, Anindita Saha, **L.L. Kharbikar** and B.S. Mahapatra. 2010. Why is ramie the strongest yet stiffest of bast fibres? *Current Science*, 98(12):1570-1572.
10. Rashmi Aggarwal; Vandana Sharma; **Lalit L. Kharbikar**; Renu. 2008. Molecular characterization of *Chaetomium* species using URP-PCR. *Genetics and Molecular Biology*, 31(4):943-946.
11. A. B. Dongre, Manoj Bhandarkar, Ravi Sawant, **Lalit Kharbikar** and Archana Gajbhiye. 2007. Assessment of genetic diversity of cotton cultivars (*Gossypium* spp.) by ISSR and microsatellite markers. *Asian Journal of Microbiology, Biotechnology & Environmental Sciences*, 9(1):29-34.
12. Khillare, A.S.; Karnewar, S.D.; Hajare, S.T.; Khedkar, C.D.; Kadam, S.B.; **Kharbikar, L.L.** and Pawar, V.N. 2005. Identification of quantitative trait loci for yield and yield contributing traits in rice. *Journal of Soil & Crops*, 15(2):370-377.
13. Dongre, A.B. and **Kharbikar, L.L.** 2004. RAPD-based assessment of genetic diversity in cotton (*Gossypium hirsutum* L.) race stock accessions. *Indian Journal of Genetics*. 64(2):94-96.

#### **Conference Proceedings:**

1. **Kharbikar, L.L.**, Shanware, A.S. and Edwards, S.G. 2018. In-silico identification of microRNA like RNAs and their regulating target functions in *Fusarium graminearum*. Annual Young Scholars' Conference-2018 (AYSC-2018), Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur, India, 23-24 February 2018 (Poster presented by the first author).
2. Sharma, S., Gupta, S., **Kharbikar, L.L.** and Aggarwal, R. 2016. Molecular and biochemical analysis of antagonistic potential of *Chaetomium globosum*. Proceedings of 6<sup>th</sup> International Conference on Plant, Pathogens and People: Challenges in Plant Pathology to Benefit Humankind. New Delhi, India, 23-27 February 2016 (Poster presented by the first author).
3. **Kharbikar, L.L.**, Majumdar, B., Ghorai, A.K., Mandal, A.B. and Karmakar, P.G. 2014. Cost-effective disruption of jute rhizospheric microbes for the extraction of total RNA using QIAGEN RNeasy Mini Kits. International Conference on Natural Fibres, Kolkata, India, 1-3 August 2014 (Poster presented by the first author).
4. **Kharbikar, L.**, Mandal, A. and Satpathy, S. 2014. Could characterization of microRNAs in jute (*Corchorus* spp.)-*Macrophomina phaseolina* interaction system help elucidate the molecular interactions between plant abiotic and biotic stress? International Conference on Biodiversity, Bioresources and Biotechnology, Mysore, Karnataka, India, 30-31 January 2014. (Oral presentation by the first author).
5. **Kharbikar, L.L.**, Dickin, E.T. and Edwards, S.G. 2013. Influence of pre-harvest moisture and harvest time on fusarium mycotoxin concentrations in winter wheat. 12th European Fusarium Seminar, Palais de la Bourse, Bordeaux, France, 117. 12-16 May 2013. (Poster presented by the first author).
6. **Kharbikar, L.L.**, Dickin, E.T. and Edwards, S.G. 2012. Effect of water regimes, fungicide and harvesting time on concentration of deoxynivalenol and zearalenone in wheat. 7th Conference of the World Mycotoxin Forum and the XIIIth IUPAC International Symposium on Mycotoxins and Phycotoxins, Rotterdam, the Netherlands, 5-9 November 2012. (Poster presented by the first author).

7. Edwards, S., **Kharbikar, L.** and Dickin, E. 2012. Zearalenone risk in wheat associated with pre-harvest rainfall. 7th Conference of the World Mycotoxin Forum and the XIIIth IUPAC International Symposium on Mycotoxins and Phycotoxins, **Rotterdam, the Netherlands**, 5-9 November 2012. (Oral presentation by the first author).
  8. **Kharbikar, L.L.**, Dickin, E.T. and Edwards, S.G. 2012. Impact of pre-harvest water regimes, fungicide and harvesting date on production of deoxynivalenol and zearalenone in winter wheat. Society of Chemical Industry BioResources Young Researchers Conference, **Reading, UK**, 4 July 2012. (Oral presentation by the first author).
  9. **L.L. Kharbikar**, B. Majumdar, A.K. Ghorai, L. Chakraborty, D. Sarkar, and B.S. Mahapatra. 2009. Herbicides resistant soil microorganisms isolated from the rhizosphere of jute (*Corchorus spp.*). International Conference on Emerging Trend in Production, Processing, and Utilization of Natural Fibres, **Mumbai, India**, 16-18, April 2009. (Poster presented by the first author).
  10. D. Sarkar, **L.L. Kharbikar**, A. Roy, C.S. Kar, M.K. Sinha and B.S. Mahapatra. 2009. Jute biotechnology road map: Present status and emerging trends. International Conference on Emerging Trend in Production, Processing, and Utilization of Natural Fibres, **Mumbai, India**, 16-18, April 2009. (Poster presented by the first author).
  11. Rashmi Aggarwal, **Lalit Kharbikar**, D.V. Singh and K.D. Shrivastava. 2005. Quantitative and qualitative analysis of secondary metabolites produced by *Chaetomium globosum*. National Symposium on Biology in the Service of Mankind in Post Genomic Era. Department of Botany, R.G. (P.G.). College, **Meerut, India**. (Poster presented by the second author).
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#### **Technical/ Popular Articles:**

1. **Kharbikar, L.L.**, Nandanwar, S.K., Shanware, A.S., Yele, Y.M., Sivalingam, P.N., Kaushal, P. and Kumar, J. (2018). Microbe-mediated salinity tolerance in plants. **Nature Research Microbiology Community**. 87843 (31111), 1 – 9 (Available online).
2. **Kharbikar, L.L.** (2017). CP gene specific D-RT PCR: A fast and cost-effective diagnostic tool to detect a viral co-infection in potato. **Nature Research Microbiology Community**. 34622 (29235), 1 – 5 (Available online).
3. **Kharbikar L.** (2017). MicroRNAs in plant-pathogen interactions: Small RNAs big impact. **Scoop.it** (Available online).
4. **Kharbikar, L.L.** (2012). *Arthrobacter corchori*, a new bacteria capable of degrading high concentrations of herbicides. **Nature Research Microbiology Community**. 34622 (15354), 1 – 2 (Available online).

#### **Sequences in NCBI:**

1. *Aspergillus niger* isolate CRIJAF/GPT 2510 18S ribosomal RNA gene, partial sequence; internal transcribed spacer 1, 5.8S ribosomal RNA gene, and internal transcribed spacer 2, complete sequence; and 28S ribosomal RNA gene, partial sequence, 589 bp linear DNA, HM136829.1 GI:299820031
2. *Curvularia eragrostidis* isolate GKC small subunit ribosomal RNA gene, partial sequence; internal transcribed spacer 1, 5.8S ribosomal RNA gene, and internal

- transcribed spacer 2, complete sequence; and large subunit ribosomal RNA gene, partial sequence, 511 bp linear DNA, KY203813.1 GI:1104417373*
3. *Chaetomium cochlioides* isolate 3326 18S ribosomal RNA gene, partial sequence; internal transcribed spacer 1, 5.8S ribosomal RNA gene, and internal transcribed spacer 2, complete sequence; and 28S ribosomal RNA gene, partial sequence, 554 bp linear DNA, HQ316556.1 GI:308390726
  4. *Chaetomium globosum* isolate Cg15 18S ribosomal RNA gene, partial sequence; internal transcribed spacer 1 and 5.8S ribosomal RNA gene, complete sequence; and internal transcribed spacer 2, partial sequence, 514 bp linear DNA, HQ224669.1 GI:308156042
  5. *Chaetomium globosum* isolate Cg12 internal transcribed spacer 1, partial sequence; 5.8S ribosomal RNA gene, complete sequence; and internal transcribed spacer 2, partial sequence, 461 bp linear DNA, HQ224666.1 GI:308156039
  6. *Chaetomium perlucidum* isolate 6009 18S ribosomal RNA gene, partial sequence; internal transcribed spacer 1, 5.8S ribosomal RNA gene, and internal transcribed spacer 2, complete sequence; and 28S ribosomal RNA gene, partial sequence, 550 bp linear DNA, HQ316557.1 GI:308390727
  7. *Chaetomium globosum* isolate 10 18S ribosomal RNA gene, partial sequence; internal transcribed spacer 1 and 5.8S ribosomal RNA gene, complete sequence; and internal transcribed spacer 2, partial sequence, 509 bp linear DNA, HQ224671.1 GI:308156044
  8. *Chaetomium reflexum* isolate Cr 5002 internal transcribed spacer 1, partial sequence; 5.8S ribosomal RNA gene and internal transcribed spacer 2, complete sequence; and 28S ribosomal RNA gene, partial sequence, 498 bp linear DNA, HQ224670.1 GI:308156043
  9. *Chaetomium globosum* isolate Cg14 internal transcribed spacer 1, partial sequence; 5.8S ribosomal RNA gene, complete sequence; and internal transcribed spacer 2, partial sequence, 468 bp linear DNA, HQ224668.1 GI:308156041
  10. *Chaetomium globosum* isolate Cg13 internal transcribed spacer 1, partial sequence; 5.8S ribosomal RNA gene, complete sequence; and internal transcribed spacer 2, partial sequence, 475 bp linear DNA, HQ224667.1 GI:308156040
  11. *Chaetomium globosum* isolate Cg11 internal transcribed spacer 1, partial sequence; 5.8S ribosomal RNA gene, complete sequence; and internal transcribed spacer 2, partial sequence, 356 bp linear DNA, HQ224665.1 GI:308156038

#### **Training Manual/ Book Chapters:**

1. **Lalit L. Kharbikar**, P. N. Sivalingam and Pankaj Kaushal. 2018. *Abiotic stress induced promoters with special reference to salinity tolerance: Molecular mechanisms and examples. Advanced training on **Detection, identification and application of microbially derived biomolecule for alleviation of salinity stress in crop plants** (under Mission of Africa by External Affairs Ministry, Govt. of India). ICAR – National Institute of Abiotic Stress Management, Baramati, India, 15–28 February, 2018.*
2. **Lalit Laxman Kharbikar** 2009. *Principles of DNA isolation and purification. A compilation of course materials and protocols, Winter School on **Molecular Techniques for Plant Virus Characterization and Diagnostics**. ICAR - Central Research Institute for Jute and Allied Fibres, Barrackpore, India, 1-21 January 2009. pp. 29-31.*

3. **Lalit Laxman Kharbikar** 2009. *Principles of Polymerase Chain Reaction (PCR). A compilation of course materials and protocols, Winter School on **Molecular Techniques for Plant Virus Characterization and Diagnostics**. ICAR - Central Research Institute for Jute and Allied Fibres, Barrackpore, India, 1-21 January 2009. pp. 32-35.*
4. **Lalit Laxman Kharbikar** 2009. *Principles of spectrophotometric measurement of DNA. A compilation of course materials and protocols, Winter School on **Molecular Techniques for Plant Virus Characterization and Diagnostics**. ICAR - Central Research Institute for Jute and Allied Fibres, Barrackpore, India, 1-21 January 2009. pp. 36-37.*
5. **Lalit Laxman Kharbikar** 2009. *Principles of agarose gel electrophoresis. A compilation of course materials and protocols, Winter School on **Molecular Techniques for Plant Virus Characterization and Diagnostics**. ICAR - Central Research Institute for Jute and Allied Fibres, Barrackpore, India, 1-21 January 2009. pp. 38-40.*
6. **Lalit Laxman Kharbikar** 2009. *Principles of plasmid isolation. A compilation of course materials and protocols, Winter School on **Molecular Techniques for Plant Virus Characterization and Diagnostics**. ICAR - Central Research Institute for Jute and Allied Fibres, Barrackpore, India, 1-21 January 2009. pp. 54-56.*
7. Rashmi Aggarwal, Renu, and **Lalit Kharbikar** 2006. *rDNA amplification by ITS-PCR. Training on **Application of Biochemical and Molecular Techniques for Characterization of Plant Pathogens**. ICAR – Indian Agricultural Research Institute, New Delhi, India, 09-29 March 2006.*

#### **Funding and Academic Awards**

- **2016: Third prize for the Poster** entitled “Molecular and biochemical analysis of antagonistic potential of *Chaetomium globosum*” authored by S. Sharma, S. Gupta, **L.L. Kharbikar** and R. Aggarwal and presented by Sapna Sharma in the **6<sup>th</sup> International Conference on Plant, Pathogens and People** Challenges in Plant Pathology to Benefit Humankind organized by Indian Phytopathological Society during February 23-27, 2016 at New Delhi India.
- **2014-2: Indian Council of Agricultural Research Fund**, for the present research program on “Bio-prospecting of jute and allied fibre crops for diseases and water associated stress signalling genes through computational characterization of microRNAs”.
- **2010-2013: Harper Adams University and Bayer CropSciences, UK studentship** for postgraduate studies in the UK.
- **2008-2010: Indian Council of Agricultural Research Fund**, for the research program on “Identification and study of the herbicide(s) resistant jute (*Corchorus olitorius*) rhizospheric microorganisms and characterization of their transcripts”.
- **2008: Agricultural Scientists Recruitment Board (Indian Council of Agricultural Research) New Delhi NATIONAL ELIGIBILITY TEST (For Lecturership/ Assistant Professorship) in the professional subject **Bio-Technology (Plant Science)**.**
- **2005: Agricultural Scientists Recruitment Board (Indian Council of Agricultural Research) New Delhi NATIONAL ELIGIBILITY TEST (For Lecturership/ Assistant Professorship) in the professional subject **Bio-Technology (Agricultural Science)**.**

- **2004:** Department of Biotechnology, Government of India - Certificate of Eligibility for DBT-Junior Research Fellowship for Ph.D.
- **2000-2002:** Department of Biotechnology, Govt. of India Fellowship for Postgraduation at Indira Gandhi Krishi Vishwa Vidyalaya, Raipur, India.

## **Career /Employment**

**Scientist**, Indian Council of Agricultural Research, National Institute of Biotic Stress Management, Raipur, India. 31, July 2017 - **present**,

“Identification of biotic stress induced promoters from resistance source plants”.

**Scientist**, Indian Council of Agricultural Research, Central Research Institute for Jute and Allied Fibres, Barrackpore, Kolkata, India. 15, October 2013 – 29, July 2017,

“Bio-prospecting of jute and allied fibre crops for diseases and water associated stress signalling genes through computational characterization of microRNAs”.

**Postgraduate Researcher**, Crop and Environment Sciences Department, Harper Adams University, Newport, Shropshire, UK, 11, October 2010 – 10, October 2013 (On study leave), “Impact of post-anthesis rainfall on the production and distribution of Fusarium mycotoxins in wheat”.

**Scientist**, Indian Council of Agricultural Research, Central Research Institute for Jute and Allied Fibres, Barrackpore, Kolkata, India. 5, July 2008 – 10, October 2010,

“Identification and study of the herbicide(s) resistant jute (*Corchorus* spp.) rhizospheric microorganisms and characterization of their transcripts”.

**Scientist (on probation)**, Indian Council of Agricultural Research, National Academy of Agricultural Research Management, Rajendranagar, Hyderabad, India, 26, February - 24, June 2008,

“Foundation Course for Agricultural Research Service”.

**Senior Research Fellow**, Division of Plant Pathology, Indian Agricultural Research Institute (I.C.A.R.), New Delhi 110012, India. 14, September 2005–22, February 2008

“Improvement of strain of *Chaetomium globosum* a potential antagonist of fungal plant pathogens and developing molecular markers for its identification”.

**Senior Research Fellow**, Division of Crop Protection, Central Institute for Cotton Research, Nagpur 440010 Maharashtra, India. 21, May, 2005\*-12, September 2005

“Biochemical and ecological factors, influencing the toxicity of Novaluron on the cotton bollworm *Helicoverpa armigera*”.

**Senior Research Fellow**, Biotechnology Laboratory, Central Institute for Cotton Research, Nagpur 440010 Maharashtra, India. 18, March 2004-31, December 2004\*

“Development of Bt-transgenic cotton for insect resistance”.

**Skilled Helper**, Biotechnology Laboratory, Central Institute for Cotton Research, Nagpur 440010 Maharashtra, India. 18, October 2003-17, March 2004

“DNA fingerprinting of cotton cultivars using molecular markers”.

**Skilled Helper**, National Research Centre for Citrus, Nagpur 440010 Maharashtra, India. April 2003-October 2003.

“Molecular marker-based analysis of citrus genetic diversity (Adhoc Project)”

**Postgraduate Student**, Indira Gandhi Krishi Vishwa Vidyalaya, 2000-2003. DBT, Govt. of India fellowship, collaboration with the Central Institute for Cotton Research (I.C.A.R.), India.

\*Preparing for Agricultural Scientists Recruitment Board (Indian Council of Agricultural Research) New Delhi AGRICULTURAL RESEARCH SERVICE EXAM (For the Post of Scientist) in the professional subject Bio-Technology (Plant Science) 01 January 2005 – 20 May 2005.