Curriculum Vitae

Name **Mathish NAMBIAR-VEETIL, PhD.,**
Designation Scientist E and Genetic Transformation lab In-charge,
Present Address Plant Biotechnology Division, Institute of Forest Genetics and Tree Breeding, Forest Campus, Coimbatore 641 002 India. **Ph.** 91 422 2484125 (O), 91 422 2450542 (R) **FAX:** +91 422 2430549;
Mail: nvmathish@yahoo.com, mathish@icfre.org
Date & Place of Birth 23rd August 1972; Calicut, Kerala, India.
Family Status Wife: Mrs. Nitha Sugathan; Daughter: Kshetragna

Educational Qualifications

Degree	Subject of specialization	Institution	Year	Percentage	Award
Ph.D., Forest Biotechnology	Genetic transformation	Institute of Forest Genetics and Tree Breeding, FRI University, DehraDun	2006	-	-
M. Sc., Biotechnology	DNA markers	CPMB, Tamil Nadu Agricultural University, Coimbatore	1996	91.0	DBT Fellow-ship holder
B. Sc., Agriculture	Agriculture	Annamalai University, Chidambaram	1993	80.8	-

Post Doctoral training (IRD, Montpellier, France): Development of post-transcriptional gene silencing approaches as a tool for the functional analysis of symbiotic genes in the tropical actinorhizal tree *Casuarina glauca* (2007-2008).

Ph.D. Dissertation : Genetic transformation studies in *Casuarina equisetifolia*

M. Sc. Dissertation: Molecular analyses for Leaf folder (*Cnaphalocrocis medinalis* GUENEE.) resistance in Rice.

Awards/ Fellowship Received/ Foreign visits/ National Level Exams Qualified

- Awarded **DST** travel grants for presenting two papers in the International Union of Forestry Research Organization's (**IUFRO's**) **Tree Biotechnology** symposium on "From genomes to integration and delivery" at **Brazil**, held from 26th June – 2nd July 2011.
- Awarded DBT associateship for pursuing one-year training at **Institut de Recherche pour le Développement** (IRD)**, Montpellier, France** from 4th July 2007 to 3rd July 2008.
- Co- recipient of the "**ICFRE award for Excellence**" for outstanding work in the discipline "**Forest Biotechnology**" for the year 2001-2002.
- Participated in the international laboratory course on "Biopesticides: Application and mechanism of action at the "**International Centre for Genetic Engineering and Biotechnology**", **New Delhi** from 8th November to 19th November, 2010
- Obtained **96.7** percentile in the Graduates Aptitude Test in Engineering (GATE 1997) conducted by Indian Institute of Science (IISc), Bangalore.
- Qualified the "**National Eligibility Test**" conducted by ICAR, and "**State Level Education Testing**" exam conducted by Bharathidasan University, Tiruchirapalli.
- Qualified for **DBT fellowship** for M. Sc. Biotechnology programme through National exam conducted by the Jawaharlal Nehru University, New Delhi.

Professional positions held

Institution	Position	Period	Duties
IFGTB, Coimbatore	Scientist E	Jan 2011 till date	Genetic transformation lab in charge
Institut de Recherche pour le Développement (IRD), Montpellier, France	DBT Overseas Associate	July 2007 - July 2008	Functional genetics studies in Casuarina.
IFGTB, Coimbatore	Scientist D	Jan 2006 – Dec 2010	Genetic transformation lab in charge
IFGTB, Coimbatore	Scientist C	Jan 2002 - Dec 2005	DNA fingerprinting studies and Genetic transformation studies in Eucalyptus and *Casuarina*
IFGTB, Coimbatore	Scientist B	March 1998 – Dec 2001	DNA fingerprinting studies in Eucalyptus

Infrastructure established

- Established **ICFRE's only** state of art facility for implementation of projects on generation and analysis of transgenic trees. Facilities include the Functional Genetics Experimental Facility (Transgenic Green House), Genetic transformation lab housing equipments including Gene gun, Real Time PCR, Fluorometer, electroporator, Stereo fluorescence microscope, culture rooms, electrophoresis rooms, molecular analysis facility etc, which are being extensively used for student training programmes and collaborative ventures.

Project Grants Received

Ongoing

- **Development of methods for functional analysis of genes involved in salt tolerance in *Eucalyptus tereticornis***. ICFRE: Rs. 30.93 lakhs 2009-16
- **Incorporating resistance in *Eucalyptus* to *Leptocybe invasa fisher & La Salle (Hymenoptera: Eulophidae)* through expression of insect specific dsRNA.** ICFRE: Rs. 29 lakhs 2009-16

Completed

- **Development of post-transcriptional gene silencing approaches as a tool for the functional analysis of symbiotic genes in the tropical actinorhizal tree *Casuarina glauca*-** *Collaborative project with IRD, France.* DBT: Rs. 11.00 lakhs
- **Genetic transformation of Eucalyptus and Casuarina to enhance salinity tolerance.** ICFRE: Rs. 9.93 lakhs
- **Identification of conserved motifs in genes conferring salt tolerance to develop strategies for gene isolation from salt tolerant tree species.** ICFRE: Rs. 0.57 lakhs
- **Web enabled database and analysis of gene sequences implicated in abiotic stress tolerance for screening gene homologues in salt tolerant tree species**. DBT: Rs. 20 lakhs.
- **Determination of target genes in *Leptocybe invasa* for engineering resistance in Eucalyptus through gene- silencing approaches**. ICFRE: 23.50 lakhs

Salient outputs from the ongoing transgenic programme

Our research mission is **"*To evolve transgenic approaches in forestry species for functional analysis of genes and genetic modification of desired traits*"**. Traits of interest, thus far have been salt tolerance and insect resistance. **Modification of pulping trait is also envisaged in collaboration with industry.**

Tissue culture and genetic transformation studies

- Genetic markers were developed for identification of mislabeled clones and somaclonal variants in micropropagated Eucalyptus germplasm (Tripathi et al., 2006). Regeneration and transformation protocols for Eucalyptus were optimized and are being used for generation of Eucalyptus transgenics for functional validation of *PsLecRLK* gene and *HKT1* genes.

- **Composite transgenic Eucalyptus strategy in which transgenic roots were generated on hypocotyl region of intact non-transgenic seedlings was developed** and is being applied for RNAi based functional analysis of the HKT1 gene homologue **in Eucalyptus** (Balasubramanian et al., 2011). Through a post doctoral programme at IRD, France, **the composite transgenics in combination with RNAi was originally used for functional analysis of genes involved in Frankial nodulation** of *Casuarina* (Gherbi et al., 2008; Svistoonoff et al., 2013, Perrine-Walker et al., 2011, Benabdoun et al., 2011, Svistoonoff et al., 2009).

Salt tolerance: Identification of genes from tolerant tree species

- Highly salt tolerant and salt susceptible clones of *Casuarina equisetifolia* were selected after screening 84 different genotypes. **Proline accumulation and shoot to root ratio of sodium were identified to play an important role in salt tolerance of *C. equisetifolia*.** *NHX1* was partially sequenced from six tolerant and five susceptible *C. equisetifolia* clones to show **minor SNP variation.**

- **Thirty five partial sequences including those of *NHX, HKT1*** and ***AKT1*** genes **from 10 salt tolerant trees were published in the GenBank database of NCBI** (Selvakesavan et al., 2014).

- **A web enabled database enabling query and bioinformatic analysis of genes conferring stress tolerance "*In Silico* Gene Bank for Adaptation to Abiotic Stresses" was developed and hosted at http://igbaas-ifgtb.icfre.gov.in** .

Insect tolerance: Identification of insect specific genes for development of RNAi based control measures

- Genes that could be targeted for gene silencing based control of insect pests **were partially sequenced and published in NCBI's GenBank database** (Nambiar-Veetil et al., 2011). The first **NGS derived transcriptome sequence data of *L. invasa* were generated to identify unique RNAi target regions for 5 genes and are being used for development of multigene silencing constructs.** A technology for delivering genes/ molecules into live potted plants was also developed.

Courses taught and other services provided to students and the home institution

Fostering International partnership

- Functioning as one of the four international partners for "**Transcriptome analysis of salt tolerance in Casuarina trees**" by the Joint Genome Institute, USA, along with the principal collaborator from Research Institute for Development, France, and partners including Université Chiekh Anta Diop, Dakar (UCAD), Senegal and University of New Hampshire, USA.

- Hosted and guided **a CV Raman Post Doctoral Researcher** from **Senegal,** Dr. Nathalie Diagne, for six months (July 2012- January 2013).

- Facilitated current PhD student, Mrs Sowmiya Rani, for winning the **DAAD Sandwich Programme** at **Germany** (Dec 2014 to March 2016).

- Functioning as IFGTB's international student coordinator. Assisted Director in preparation of ICFRE guidelines for Externally funded Post Doctoral Fellows.

Students supervised for B.Tech/ M.Sc/ project dissertations during the last 5 years

- PhD scholars : 2 submitted, 2 ongoing (including one DAAD fellow)
- CSIR scholars : 2

Sowmiya Rani, K.S. 2014. Identification and functional analysis of genes of the Teak insect pest *Hyblaea puera* Cramer (Hyblaedae: Lepidoptera) for the development of gene silencing based pest control. Project report submitted to CSIR.

Thushara, P. 2012. Genetic transformation of *Casuarina* for the functional analysis of genes conferring salt tolerance. Project report submitted to CSIR.

- B. Tech./ M.Sc./ short project dissertations : 8

Dayalakshmi, 2010. Optimisation of *in vitro* regeneration system for genetic modification of Eucalyptus and Casuarina. M.Sc. dissertation submitted to Bharathiar University, Coimbatore.

Suresh Kumar, M., 2010. Comparison of *Agrobacterium tumefaciens* mediated and biolistic mediated transformation in *Eucalyptus camaldulensis*. M.Sc. dissertation submitted to Bharthiar University, Coimbatore.

Usha, J. 2013. Evaluation of different *Agrobacterium rhizogenes* strains and culture conditions for generation of composite plants in *Eucalyptus camaldulensis*. M.Sc. dissertation submitted to Bharathiar University, Coimbatore.

Lalitha, P. 2013. Identification of genes involved in the growth and development of *Leptocybe invasa* (Hymenoptera: Eulophidae). M.Sc. dissertation submitted to Bharathiar University, Coimbatore.

Kruthika, S. 2014. Identification of vermilion and white genes from *Leptocybe invasa* and *Hyblaea puera".* B. Tech. project dissertation submitted to Anna University, Tiruchirapalli.

Satyendra Singgh Patel, 2014. *In- silico* analysis of plant chloride transporters and genes of marine halophile *Artemia*". Project report submitted to FRI University

Suganya, R. 2015. Evaluation of different explants for *in vitro* regeneration efficiency for efficient genetic transformation of *Eucalyptus camaldulensis*. M.Sc. dissertation submitted to Bharathiar University

Yamini, R. 2015. *In silico* analysis of potential microRNA transcripts and their target genes in *Leptocybe invasa.* B. Tech. project dissertation submitted to Vinayaka Missions University, Salem.

Other professional activities, such as workshops, seminars and consultations

Training conducted as Course Director:

- Identified as a Nodal officer in the subject area of Genetic Engineering, by ICFRE for training of ICFRE scientists.

  - As Course coordinator, organised a two weeks training programme on **"Genetic Engineering"** for **ICFRE Scientists** from March 11-22, 2013.

  - Mentored Mrs. Tressa Dominic, Scientist B, from 24th May 2013 to 21st June 2013 as a part of the **ICFRE training programme for newly recruited Scientists.**

- Conducted training on "Biotechnological applications in Tree Breeding" for **High School Biology teachers** from February 09-10, 2012.
- Conducted training on "Tissue culture and its applications in Tree Breeding" for **High School Biology teachers** from March 23th to 24th 2010 and compiled the training manual.

Talks delivered in National Seminars/ workshops and institutions during the last five years

- As **Keynote speaker** presented talk on "**Genetic engineering for abiotic stress tolerance**" in the **National Seminar on "Biotechnology in Agriculture- Benefits and Risks"** on 15th Jan 2014 at St. Thomas College, Ranny, Kerala. Talks were also presented at **Environmental Protection Training and Research Institute,** Hyderabad on 27th Sept 2013 for **IFS refresher course**, and UG and PG students of Sree Krishna college Coimbatore (7th Aug 2014) and Tamil Nadu Agricultural University, Coimbatore (27th March 2015).
- Talks on "**RNAi in Plants: Strategies and application in gene function analysis and genetic modification for desired traits**" for the **National Seminar cum Workshop on "Computational Biology and Applications"** were presented on 11th March 2011 at Bharathiar University, Coimbatore and the **"National Seminar on Application of Bioinformatics"** on 19th August, 2011 at Calicut University, Kozhikode.

Membership and activities in professional associations

- Functioning as a DBT, Govt. of India, Nominee for the Institutional Biosafety Committee of Bharathiar University, Coimbatore and Tamil Nadu Agricultural University (TNAU), Coimbatore.
- Functioning as member secretary of the Institutional Biosafety Committee Meeting, IFGTB, and organized 13 IBSC meetings.

Publications

Svistoonoff, S., Benabdoun, F.M., **Nambiar-Veetil, M.,** Imanishi, L., Vaissayre, V., et al. 2013. The independent acquisition of plant root nitrogen-fixing symbiosis in Fabids recruited the same genetic pathway for nodule organogenesis. PLoS ONE, 8: e64515. doi:10.1371/journal.pone.0064515. Impact factor: 3.234

Zhong, C., Mansour, S., **Nambiar-Veetil, M.,** Bogusz, D., and Franche, C. 2013. *Casuarina glauca*: A model tree for basic research in actinorhizal symbiosis. J Biosci, 38: 815-23. Impact factor: 1.8

Diagne, N., Arumugam, K., Ngom, M., **Nambiar-Veetil, M.**, Franche, C., Narayanan, K.K., and Laplaze, L. 2013. Use of Frankia and actinorhizal plants for degraded lands reclamation. Biomed Res Int, 2013:948258. Epub Nov 11. Impact factor: 2.880

Balasubramanian, A., Venkatachalam, R., Selvakesavan R. K., Abraham, S. M., Gherbi, H., Svistoonoff, S., Franche, C., Bogusz, D., Krishna Kumar, N. and **Nambiar-Veetil, M.**, 2011. Optimisation of methods for *Agrobacterium rhizogenes* mediated generation of composite plants in *Eucalyptus camaldulensis*. BMC Proc, 5 (Suppl 7):O45.

Nambiar-Veetil, M., Sangeetha, M., Sowmiya Rani, K. S., Aravinthakumar, V., Selvakesavan, R. K., Balasubramanian, A., Venkatachalam, R., Abraham, S. M., Jacob, J. P. and Krishna Kumar, N. 2011. Identification of insect-specific target genes for development of RNAi based control of the Eucalyptus gall pest *Leptocybe invasa* Fisher & La Salle (Hymenoptera: Eulophidae). BMC Proc, 5(Suppl 7):P98

Selvakesavan, R.K., Thushara, P, Sanu Mary Abraham, Balasubramanian,A, Sowmiya Rani, K.S., Ganesh, D. and **Nambiar-Veetil, M**. 2014. Identification of sodium hydrogen antiporter gene homologues from salt tolerant tree species. Int. J.Cur. Tr. Res, 3 (2):90-95.

Benabdoun, F.M., **Nambiar-Veetil, M.,** Imanishi, L. Svistoonoff, S., Ykhlef, N., Gherbi, H. and Franche, C. 2011. Composite actinorhizal plants with transgenic roots for the study of symbiotic associations with *Frankia*. J Bot, Article ID 702947, 8 pages

Perrine-Walker, F., Gherbi, H., Imanishi, L., Hocher, V., Ghodhbane-Gtari, F., Lavenus, J, Benabdoun, M, **Nambiar-Veetil, M.,** Svistoonoff, S., and Laplaze, L. 2011. Symbiotic signaling in actinorhizal symbioses. Curr Protein Pept Sci, 12: 156-164. Impact Factor: 2.328

Svistoonoff, S., Gherbi, H., **Nambiar-Veetil, M.,** Zhong, C., Michalak, Z., Laplaze, L., Vayssaire, V., Auguy, F., Hocher, V., Doumas, P., Bonneau, J., Bogusz, D., and Franche, C. 2009. Contribution of transgenic *Casuarinaceae* to knowledge of the actinorhizal symbiosis. Symbiosis, 50: 3-11. Impact Factor : 1.438

Gherbi, H., **Nambiar-Veetil, M**., Zhong,C., Félix, J., Autran, D., Girardin, R., Vaissayre, V., Auguy, F., Bogusz, D and Franche, C. 2008. Post- transcriptional gene silencing in the root system of the actinorhizal tree *Allocasuarina verticillata*. Mol Plant Microbe In, 21: 518–524. Impact Factor: 3.944

Tripathi, S.B., **Nambiar-Veetil, M.,** and Gurumurthi, K. 2006. Use of genetic markers in the management of micropropagated *Eucalyptus* germplasm. New Forest, 31:361-372. Impact Factor: 1.829, Citation 8

Nambiar-Veetil, M., Tripathi S.B., and Gurumurthi K. 2001. DNA- Fingerprint database management using Microsoft Access- a simple strategy to corroborate fingerprints of clones. PCBMB, 2: 119-124.

Books and Book chapter

Nambiar-Veetil, M. and Krishnakumar, N (Eds). 2013.Twenty-five years of Biotechnology Research at IFGTB. Institute of Forest Genetics and Tree Breeding, Coimbatore 641002

Nambiar-Veetil, M., Selvaraj, P., George, B.S., Ganesan, M., Raghunath, T. P., and Krishnakumar N. 2015. Synchronous and rhythmic light display by a panoramic congregation of fireflies at Varagaliar, Anamalai Tiger Reserve, 197-201: In Biodiversity Conservation- Challenges for Future, Laladhas, K.P., Oommen, O. V. and Sudhakaran, P.R. (Eds.), Bentham Science Publishers, Sharjah.

Database developed and hosted

Web enabled database on gene sequences related to Abiotic stress tolerance was released online for researchers working on abiotic stress tolerance www.igbaas-ifgtb.icfre.gov.in

Patents

Developed an accessory for Gene delivery for which patent is to be filed.

NCBI sequence submissions

Thirty five partial sequences of genes from salt tolerant tree species and insects pest published in NCBI with accession numbers: JF786711, JN157810.1, JN157814.1, JX840854, JN157813.1, JN629033, JX840853, JQ837965, JN157811.1, JX840860, JQ837963, JN157812.1, JX218027.1, JX840855, JX840859, JN629034, JX679724, JX679717, JX679718, JX679719, JX679720, JX679721, JX679722, JX840856, JX840857, JX840858, JX679723, JQ837964, JF772551.1, JF772552.1, JN381022.1, JN673812.1, JQ319890. 1, JF774409.1, JX101956.1

Community service

I am a regular donor of food and clothing to an orphanage “Udavum Karangal”, at Chennai and Coimbatore for more than 10 years. I also enjoy and spend time in helping students who approach me for choosing appropriate courses and careers based on their aptitude.