Dr. Modhumita Dasgupta
Scientist G
Division of Plant Biotechnology and Cytogenetics
Institute of Forest Genetics and Tree Breeding
Forest Campus, R.S. Puram
Coimbatore- 641002, Tamil Nadu, India
Email : ghoshm@icfre.org; gmodhumita@gmail.com
Tel No. : +91-422-2484123 (O); +91-9894957110 (M)
https://www.researchgate.net/profile/Modhumita_Ghosh

Educational History:

Name of Institution (City/Country)	Period	Field of Study	% of Marks	Degree
Centre for Plant Molecular Biology, Osmania University, Hyderabad, India	1994-2000	Molecular Biology	-	Doctorate in Philosophy (Genetics)
Pachaiyappas College, University of Madras, Chennai, India	1992-1993	Experimental embryology	74%	Master of Philosophy (Botany)
Pachaiyappas College, University of Madras, Chennai, India	1990-1992	Botany	71.6%	Master of Sciences
J,B.A.S. Women's College, University of Madras, Chennai, India	1987-1990	Botany, Chemistry & Zoology	81.5%	Bachelor of Sciences

Professional Appointments:

S. No.	Institution	Position	From (Date)	To (date)
1.	Institute of Forest Genetics and Tree Breeding, Coimbatore	Scientist G	2020	Till date
2.	Institute of Forest Genetics and Tree Breeding, Coimbatore	Scientist F	2015	2019
3.	Institute of Forest Genetics and Tree Breeding, Coimbatore	Scientist E	2010	2015
4.	Institute of Forest Genetics and Tree Breeding, Coimbatore	Scientist D	2006	2010
5.	Institute of Forest Genetics and Tree Breeding, Coimbatore	Scientist C	2002	2005
6.	Institute of Forest Genetics and Tree Breeding, Coimbatore	Scientist B	1998	2001

Major areas of Research:

- Comprehending the molecular basis of host – pathogen interaction in tree species
- Isolation and *in planta* validation of defense-relatd genes
- Application of DNA markers in tree improvement programs
- Bio-prospecting novel antifungal proteins from medicinal plants
- Understanding molecular mechanisms of wood formation and water stress response in Eucalypts using genome-wide expression data.
- Karyotyping and molecular cytogenetics using FISH technology
- Understanding adaptive diversity using landscape genomics.
- Whole genome and transcriptome sequencing, assembly and annotation of tropical tree species.

Projects

Ongoing Projects:

- Genome wide and geospatial approaches for enhancing the adaptive potential of threatened rattan resources in India (Dept of Biotechnology, GoI) (Part of Network project).
- Documentation and management of adaptive genetic diversity in *Santalum album* (Indian sandalwood) for conservation and improvement programs (Dept of Biotechnology, GoI) (Part of Network project).
- Development of DNA marker sets for origin verification and timber tracking (National Biodiversity Authority, GoI) (Part of Network project).
- Generation of genomic resources and mapping of genetic diversity of sandalwood populations for conservation and improvement (MoEF&CC, GoI) (Part of AICRP-Sandalwood).
- Identification of secondary development specific miRNAs and polymorphism in their target sites for cataloging new molecular markers for wood formation in *Eucalyptus tereticornis* (MoEF&CC, GoI) (Part of AICRP-Eucalyptus).

Completed Projects:

- ✓ Genome evaluation and characterization in Casuarinas and Eucalyptus for improving productivity and conservation.
- ✓ Identification of broad-spectrum antifungal protein from elite medicinal plants for control of plant pathogens.
- ✓ Differential analysis of transcript expression in *Casuarina – Trichosporium* interaction to isolate defense – related genes.
- ✓ Production of recombinant antifungal/antipest lectin from *Withania somnifera.*
- ✓ High throughput multi environmental phenotyping of mapping of Eucalypts for Adventitious rooting and wood property traits.
- ✓ Candidate gene association for identification of pulping trait markers in *Eucalyptus tereticornis.*

- ✓ Multi-environment non destructive phenotyping of wood property traits in inter-specific hybrids of Eucalyptus (Dept of Biotechnology, GoI) (Part of Network project).
- ✓ Development of candidate gene based DNA markers in Eucalypts for linkage and QTL mapping (Dept of Biotechnology, GoI) (Part of Network project).
- ✓ Establishment of phenomics facility and screen water stress tolerant clones of Eucalypts for trait based breeding program (Dept of Biotechnology, GoI) (Part of Network project).

Awards & Honors (Individual)

1. Awarded ICFRE Woman Professional Award – 2018
2. Awarded Plant Science Innovation Award at Indian Plant Science Congress 2019 held at SRM Institute of Science and Technology, Chennai from 23-25 January 2019 for ArborEasy® DNA isolation kit.
3. Chief Instructor of the the Guinness World Record on "Most people conducting a DNA isolation experiment simultaneously" held at 4th India International Science Festival held at Lucknow from 5 – 8 October 2018.
4. Recepient of travel grant from Australian Centre for International Agricultural Research (ACIAR) to attend the IUFRO Eucalypt Conference 2015 held at Zhangiang, China in 2015.
5. Recipient of fellowship from International timber trade organization (ITTO) for the year 2012-2013 to undergo hands-on-training "Molecular cytogenetics techniques" at Texas A&M university, College Station, Texas, USA.
6. Recipient of DBT-CREST Award for the year 2010-2011 by Department of Biotechnology, Govt. of India.
7. Recipient of Scientist Assistance Program (SAP) Grant to attend the XXIII IUFRO World Congress in 2010.
8. Recipient of International travel grant from FAO to attend the World Forestry Congress on "Forests in Development: A Vital Balance"in 2009.
9. Recipient of International travel grant to attend the International Symposium on "Forest Genetic Resources Conservation and sustainable utilization towards climate change mitigation and adaptation" at Kuala Lumpur, Malaysia in 2009.
10. Recipient of International grant to attend the Training workshop "Forest Biodiversity - Conservation and Management of Forest Genetic Resources" held at Kuala Lumpur, Malaysia in 2008.
11. Received (along with five other researchers) the ICFRE Award of Excellence in Forest Biotechnology for the year 2001-2002.
12. Qualified CSIR-UGC National Eligibility Test.
13. University First rank holder for Masters degree.
14. Recepient of Pulni Andy Gold medal for Masters degree. Recepient of Madras University Student club Endowment prize for Masters degree.
    Recepient of Jawaharlal Nehru Memorial Award for Masters degree.
15. University Second rank holder for Bachelors degree.

16. Recepient of National Scholarship from Govt. Of India for Bachelors degree.

IPRs:

- Filed complete specification for patent titled "A multilocus high resolution melting analysis for viral genes" with Application number E-2/3723/2021/CHE.
- Granted Indian patent titled "A simple protocol for isolation of undegraded total RNA from Eucalyptus and Casuarina and cDNA synthesis from unpurified RNA" (patent number 272765).
- Trade mark has been registered for the name 'ArborEasy' to enable branding of the DNA isolation kit.

Technology Transfer to R& D Company:

- The technology on "Isolation of Nucleic Acid from plant tissues" was ***licensed to Sai Genomics Solutions, Coimbatore on non-exclusive basis*** in collaboration with Biotech Consortium India Ltd. New Delhi. It is a low cost, rapid and high recovery protocol for isolation of nucleic acid without use of any hazardous chemicals.

Membership in National and International Committees:

1. Member of ICFRE Society since 29 December 2020.
2. Member of RAC of Central Sericultural Germplasm Resources Centre (MoT), Hosur
3. Member of Senate, Bharathiar University, Government of Tamil Nadu from 21 August 2019.
4. Deputy Co-ordinator of the IUFRO Unit 2.04.01 – Population, Ecological and Conservation Genetics.
5. Member of Screening Committee of the NER Twinning R&D Program under Department of Biotechnology, Government of India from 2016.
6. Member of Task Force on "Basic Plant Biology, Agriculture and Frontier Areas" of Department of Biotechnology, Govt. of India from 2014.
7. Nominated as Nodal Officer in subject area of "Genome Mapping and Sequencing" by Indian Council of Forestry Research and Education, Dehra Dun from 2014.
8. Deparment of Biotechnology, Govt of India nominee to the Institutional Biosafety Committee of Bharathidasan University, Trichy and Rubber Research Institute of India, Kottayam from 2013.
9. Member of International Climate-Resilient Crop Genomics Consortium (ICRCGC) since 2012.
10. Member of Ginger group and Think tank of Indian Council of Forestry Research and Education, Dehra Dun, India.
11. Member of the Research Advisory Group of Institute of Forest Genetics and Tree Breeding, Coimbatore from 2008 – 2009.

International Trainings:

- Ungergone two months training in "Molecular Cytogenetics Techniques" from March 2014 to May 2014 at Forest Science Laboratory, Department of Ecosystem Science & Management Texas A&M University, College Station, Texas, USA under the ITTO fellowship.

- Undergone six months training on "Forest Genomics" at Department of Ecosystem Science & Management Texas A&M University, College Station, Texas, USA from November 2011 to April 2012 under the DBT-CREST Award funded by Department of Biotechnology, Govt. Of India. The title of the project undertaken was 'SNP discovery in candidate genes related to wood property traits in Eucalypts for QTL and Association mapping'.

Publications:

Research papers :	47
Books (Chapter):	9
Cumulative Impact factor :	67.426
h-index:	14

Selected peer-reviewed publications

1. Ghosh Dasgupta, M., Dev, S.A., Muneera Parveen, A.B., Sarath, P. and Sreekumar, V.B. (2021). Draft genome of Korthalsia laciniosa (Griff.) Mart., a climbing rattan elucidates its phylogenetic position. Genomics 113: 2010-2022 (JIF: 5.736)

2. Muneera Parveen, A.B., Muthupandi, M., Kumar, N., Chauhan, S.S., Vellaichamy, P., Senthamilselvam, S., Rajasugunasekar, D., Nagarajan, B., Mayavel, A., Bachpai, V.K.W., Sivakumar, V. and Ghosh Dasgupta, M. (2021). Quantitative genetic analysis of wood property traits in biparental population of Eucalyptus camaldulensis x E. tereticornis. Journal of Genetics 100:46 (JIF: 1.166)

3. Senthilkumar, S., Ulaganathan, K. and Ghosh Dasgupta, M. (2021) Reference-based assembly of chloroplast genome from leaf transcriptome data of Pterocarpus santalinus. 3 Biotech 11: 393. https://doi.org/10.1007/s13205-021-02943-0 (JIF: 2.406)

4. Ghosh Dasgupta, M., Muneera Parveen, A.B., Rajasugunasekar, D. and Ulaganathan, K. (2021). Wood transcriptome analysis and expression variation of lignin biosynthetic pathway transcripts in Ailanthus excelsa Roxb., a multi-purpose tropical tree species. J of Biosciences 46:105 (JIF: 1.826)

5. Ghosh Dasgupta, M., Abdul Bari, M.P., Shanmugavel, S., Dharanishanthi, V., Muthupandi, M., Kumar, N., Chauhan, S.S., Kalaivanan, J., Mohan, H., Krutovsky, K.V.,

Rajasugunasekar, D. (2021). Targeted re-sequencing and genome-wide association analysis for wood property traits in breeding population of Eucalyptus tereticornis × E. grandis. Genomics 113(6): 4276-4292 (JIF: 5.736).

6. Muthulakshmi, V., Vijayam, C.V., Bachpai, V.K.W. et al. (2020) Genetic control of adventitious rooting traits in bi-parental pedigree of Eucalyptus tereticornis?X?E. camaldulensis. New Forests https://doi.org/10.1007/s11056-020-09810-5 (JIF: 2.240).

7. Amrutha, S. Muneera Parveen, A.B., Muthupandi, M., Vishnu, K., Bisht, S.S., Sivakumar, V. and Ghosh Dasgupta, M. (2021). Characterization of Eucalyptus camaldulensis clones with contrasting response to short-term water stress response. Acta Physiologia Plantarum https://doi.org/10.1007/s11738-020-03175-0. (JIF: 1.760).

8. Ghosh Dasgupta, M., Burragoni, S., Amrutha, S., Muthupandi, M., Muneera Parveen, A.B., Sivakumar, V. and Ulaganathan, K. (2020) Diversity of bacterial endophyte in Eucalyptus clones and their implications in water stress tolerance. Microbiological Research https://doi.org/10.1016/j.micres.2020.126579. (JIF: 3.97).

9. Muneera Parveen, A.B., Lakshmanan, D. and Ghosh Dasgupta, M. (2020). Validation of variants using cost effective highresolution melting (HRM) analysis predicted from target re-sequencing in Eucalyptus. Acta Botanica Croatica. https://doi.org/10.37427/botcro-2020-019. (JIF: 0.985).

10. George, B.S., Silambarasan, S., Senthil, K., Jacob, J.P. and Ghosh Dasgupta, M. (2020). Ectopic expression of WsMBP1 from *Withania somnifera* in transgenic tobacco shows insecticidal activity against teak defoliator Hyblaea puera (Lepidoptera: Hyblaeidae). Biologia DOI: 10.2478/s11756-020-00531-w (JIF: 0.728)

11. Amrutha, S., Muneera Parveen, A., Muthupandi, M., Sivakumar, V., Nautiyal, R. and Ghosh Dasgupta, M. (2019). Variation in morpho-physiological, biochemical and molecular responses of two Eucalyptus species under short-term water stress. Acta Botanica Croatica 78: 125–134 (JIF: 0.985).

12. Dasgupta, M.G., Ulaganathan, K., Dev, S.A., and Balakrishnan, S. 2019. Draft genome of Santalum album L. provides genomic resources for accelerated trait improvement. Tree Genetics & Genomes 15: 34. (JIF: 1.829).

13. Vikashini, B., Shanthi, A. and Ghosh Dasgupta, M. 2018. Identification and expression profiling of genes governing lignin biosynthesis in Casuarina equisetifolia L. Gene https://doi.org/10.1016/j.gene.2018.07.012 (JIF: 2.498)

14. Dharanishanthi, V. and Ghosh Dasgupta, M. 2018. Co-expression network of transcription factors reveal ethylene-responsive element-binding factor as key regulator of wood phenotype in Eucalyptus tereticornis. 3 Biotech https://doi.org/10.1007/s13205-018-1344-6 (JIF: 1.497)

15. Dharanishanthi, V. and Ghosh Dasgupta, M. 2018. Co-expression network of secondary cell wall biogenesis genes in Eucalyptus tereticornis. Silvae Genetica 67: 72 – 78. (JIF: 0.277).

16. George, B.S., Silambarasan, S., Senthil, K., Jacob, J.P. and Ghosh Dasgupta, M. (2018). Characterization of an insecticidal protein from Withania somnifera against lepidopteran and hemipteran pest. Molecular Biotechnology DOI: 10.1007/s12033-018-0070-y. (JIF: 1.634)

17. Ghosh Dasgupta, M. and Dharanishanthi V. (2017). Identification of PEG-induced water stress responsive transcripts using co-expression network in Eucalyptus grandis. Gene (JIF: 2.415).

18. Dharanishanthi, V. and Dasgupta, M. G. (2016). Construction of co-expression network based on natural expression variation of xylogenesis-related transcripts in Eucalyptus tereticornis. Molecular biology reports, 43: 1129-1146 (JIF: 1.698).

19. Dasgupta, M.G., Dharanishanthi, V., Agarwal, I. and Krutovsky, K.V. (2015). Development of genetic markers in Eucalyptus species by target enrichment and exome sequencing. PLoS ONE 10(1): e0116528. doi:10.1371/journal.pone.0116528 (JIF: 3.534). (JIF: 3.534)

20. Radha Veluthakkal and Modhumita Ghosh Dasgupta (2015). *Agrobacterium*-mediated transformation of chitinase gene from the actinorhizal tree *Casuarina equisetifolia* in *Nicotiana tabacum*. Biologia 70: 905–914 (JIF: 0.827)

21. Ghosh Dasgupta, M., George, B.S., Bhatia, A. and Sidhu, O.P. (2014). Characterization of Withania somnifera leaf transcriptome and expression analysis of pathogenesis – related genes during salicylic acid signaling. PLoS ONE 9(4): e94803. doi:10.1371/journal.pone.0094803. (JIF: 3.534)

22. Karpaga Raja Sundari, B. and Ghosh Dasgupta, M. (2014). Isolation of developing secondary xylem specific cellulose synthase genes and their expression profiles during hormone signalling in *Eucalyptus tereticornis*. Journal of Genetics 93: 403 - 414. (JIF: 1.013)

23. Veluthakkal, R and Ghosh Dasgupta, M. (2012). Isolation and characterization of pathogen defence-related class I chitinase from the actinorhizal tree *Casuarina equisetifolia*. Forest Pathology, DOI: 10.1111/j.1439-0329.2012.00781.x (JIF: 1.67)

24. Veluthakkal, R., B. Karpaga Raja Sundari, Ghosh Dasgupta, M. (2012). Tree chitinases – stress and developmental-driven gene regulation. Forest Pathology, DOI: 10.1111/j.1439-0329.2011.00759.x (JIF: 1.67)

25. Ghosh, M., Chezhain, P., Sumathi, R. and Yasodha, R. (2011). Development of SCAR marker in *Casuarina equisetifolia* for species authentication. Trees - Structure and Function 25: 465-472. (JIF: 1.685)

26. Ghosh M. (2006). Antifungal properties of haem peroxidase from Acorus calamus. Annals of Botany 98(6):1145-1153. (JIF: 2.44)

27. Balasaravanan, T., Chezhian, P., Kamalakannan, R., Ghosh, M., Yasodha, R., Varghese, M. and Gurumurthi, K. (2005). Analysis of inter- and intra-species genetic relationships among six *Eucalyptus* species by inter-simple sequence repeats (ISSR). Tree Physiology 25: 1295–1302. (JIF: 2.101)