



Dr. Shalini Mudalkar

Assistant Professor- Tissue culture

Department of Tree breeding and improvement

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Profile summary

Shalini Mudalkar is Assistant Professor in the department of Tree Breeding and Improvement, Forest College and Research Institute, Hyderabad at Mulugu. She worked extensively on physiological, bio-chemical and molecular responses of potential biofuel plant *Jatropha curcas* to salt, drought and metal stress conditions. Her research work provides insights into detoxification of reactive carbonyl (methylglyoxal) and metals where she was successful in functional characterisation of key genes including aldo-ketoreductase, glyoxalases and metallothionein. In addition, her findings related to the transcriptome analysis of three imminent biofuel plants including *Camelina*, *Jatropha* and *Pongamia* received good citations.

She is currently working in the areas of Plant Molecular Biology, Plant tissue culture towards the molecular characterization of medicinal, aromatic,

essential oil and dye yielding plants through 'Omics' studies. In addition, she also intends to focus on Climate change and sustainable forest management.

Educational qualifications

- Ph.D in Plant Sciences, University of Hyderabad, Hyderabad, Telangana State, India (2010-2017)
- M.Sc in Plant biology and Biotechnology, University of Hyderabad, Hyderabad, Telangana State, India (2010)
- B.Sc (Genetics and biotechnology, Botany, Biological chemistry), Osmania University College for Women, Osmania University, Hyderabad, Telangana State, India (2008)

Teaching interests

- Principles of cytology and genetics
- Forest Biotechnology

Research areas

- Plant tissue culture.
- Plant Molecular Biology.
- 'Omics' of medicinal, aromatic and essential oil yielding plants.
- 'Omics' of dye yielding plants and methods of dye extraction.
- Climate change and sustainable forest management

Courses taught

- Plant Molecular Biology
- Plant abiotic stress tolerance

Fellowships/awards

- Qualified ASRB-NET (2018)
- Award for publishing research work in high impact factor journal for the year 2017 in 9th Plant Sciences Colloquium held at University of Hyderabad.
- Telangana Academy Young Scientist Award-2016.

- Received international travel grant from DST (SBI/ITS/04675/2013-2014) and UPE Phase 2 to attend conference on “Plant gene discovery and omics technologies” held at Vienna, Austria
- Qualified CSIR – UGC JRF-NET (2010)

Journal publications

1. Rachapudi Venkata Sreeharsha, Shalini Mudalkar, Debashree Sengupta, Divya K. unnikrishnan, Attipalli Ramachandra Reddy. Mitigation of drought induced oxidative damage by enhanced carbon assimilation and an efficient antioxidative metabolism under high CO₂ environment in pigeonpea (*Cajanus cajan* L.). *Photosynthetic Research* (2018) doi.org/10.1007/s11120-018-0586-9
2. Sumit Kumar, Rachapudi Venkata Sreeharsha, Shalini Mudalkar, Attipalli Ramachandra Reddy. Sequencing and assembly of transcriptome from *Jatropha curcas* L., a potential biofuel plant, grown under elevated CO₂ showed differential expression of key regulatory genes involved in photosynthetic carbon reduction cycle. *Scientific Reports* (2017) 7:11066
3. Shalini Mudalkar, Rachapudi Venkata Sreeharsha, Attipalli Ramachandra Reddy. Involvement of glyoxalases and glutathione reductase in conferring abiotic stress tolerance to *Jatropha curcas* L. *Environmental and Experimental Botany* (2017) 134:141-150
4. Rachapudi V Sreeharsha, Shalini Mudalkar, Kambam T Singha, Attipalli R Reddy. Unravelling molecular mechanisms from floral initiation to lipid biosynthesis in a promising biofuel tree species, *Pongamia pinnata* (L.) using transcriptome analysis. *Scientific Reports* (2016) 6:34315
5. Shalini Mudalkar, Rachapudi Venkata Sreeharsha, Attipalli Ramachandra Reddy. A novel aldo-ketoreductase from *Jatropha curcas* L. (JcAKR) plays a crucial role in the detoxification of methylglyoxal, a potent electrophile. *Journal of Plant Physiology* (2016) 195: 39-49.

6. Shalini Mudalkar, Ramesh Golla, Sreenivas Ghatty, Attipalli Ramachandra Reddy. Denovo transcriptome analysis of an imminent biofuel crop, *Camelina sativa* L. using Illumina GAII-X sequencing platform and identification of SSR markers. *Plant Molecular Biology* (2014) 84:159–171.
7. Shalini Mudalkar, Ramesh Golla, Debashree Sengupta, Sreenivas Ghatty, Attipalli Ramachandra Reddy. Molecular cloning and characterisation of metallothionein type 2a gene from *Jatropha curcas* L., a promising biofuel plant. *Molecular Biology Reports* (2014) 41:113–124.
8. Kalva Madhana Sekhar, Venkata Sreeharsha Rachapudi, Shalini Mudalkar, Attipalli Ramachandra Reddy. Persistent stimulation of photosynthesis in short rotation coppice mulberry under elevated CO₂ atmosphere. *Journal of Photochemistry and Photobiology B: Biology* (2014) 137: 21–30.
9. Debashree Sengupta, Shalini Mudalkar, Attipalli R. Reddy. Detoxification potential and expression analysis of eutypine reducing aldehyde reductase (VrALR) during progressive drought and recovery in *Vignaradiata* (L.) Wilczek roots. *Planta* (2012) 236:1339-1349.
10. Debashree Sengupta, Golla Ramesh, Shalini Mudalkar, Koppolu Raja Rajesh Kumar, Pulugurtha Bharadwaja Kirti, Attipalli R. Reddy. Molecular Cloning and Characterization of γ -Glutamyl Cysteine Synthetase (Vr γ ECS) from Roots of *Vigna radiata* (L.) Wilczek under Progressive Drought Stress and Recovery. *Plant Molecular Biology Reporter* (2012) 30:894–903.

Books/book chapters published

1. Sumit Kumar, Shalini Mudalkar, Attipalli R. Reddy. Phenology and photosynthetic physiology of *Jatropha curcas* L. grown under elevated atmospheric carbon dioxide in a semi-arid environment. Mulpuri Sujatha

et al. (Eds): *Jatropha*, Challenges for a New Energy Crop (2019), 14: 273-288.

Research projects

- Functional characterization of abiotic stress responsive genes from *Jatropha curcas* L., a potential biofuel plant.

Workshops/Conferences/symposiums

- **Poster presentation at 8th International conference on Photosynthesis and Hydrogen Energy Research for sustainability-2017**, October 20-November 03 2017, Held at Hyderabad, India. Growth and photosynthesis responses of *Jatropha curcas* L., to water and salinity stress.
- **Telangana Academy Young Scientist Award-2016**, 01 July 2017, Abiotic stress tolerance in biofuel plants: identifying key molecular targets.
- **Poster presentation-Interdrought-V**, February 21-25 2017, held at Hyderabad, India. JcAKR, an aldo keto reductase from *Jatropha curcas* L., and its role in drought and salt tolerance.
- **Poster presentation- International Plant Physiology Congress**, December 11-14 2015, held at New Delhi, India. Interplay between aldo-keto reductase (AKR) and glyoxalases as an important strategy for methylglyoxal detoxification during abiotic stress in *Jatropha curcas* L.
- **Poster presentation- Plant gene discovery and Omics technologies**, February 17-18 2014 held at Vienna, Austria. Transcriptome analysis of an emerging biofuel crop-*Camelina sativa* L., for unraveling the genes associated with lipid metabolism and other metabolic pathways.
- **Oral presentation in Plant Science Colloquium** held on 14th March 2014 at department of Plant Sciences, University of Hyderabad, Hyderabad. Cloning and characterization of type 2 metallthionein from

*Jatropha curcas*L.

- **Participation in Bioquest 2015** organized by School of Life Sciences, University of Hyderabad, Hyderabad.
- **Genomics Training Workshop** for Quantitative PCR and Microarray under UoH – DBT – CREBB programme at University of Hyderabad, Hyderabad.
- **One year M.Sc. dissertation** research on “Cloning and characterization of metallothionein type 2 gene from *Vigna radiata*”, 2009-2010 at Department of Plant Science, University of Hyderabad.
- **Participation in “All India Cell Biology Conference and International Workshop on Cell Cycle regulation”** Dec 10th-13th 2009, organized by School of Life Sciences, University of Hyderabad.