

Faculty Details

Name: Padmaja Gudipalli

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Area of Specialization: Plant Genetics and Biotechnology

Dr. Gudipalli Padmaja has obtained M.Sc. and Ph.D. degrees in Genetics from Department of Genetics, Osmania University. She has done her post-doctoral research during 1991-1993 under the supervision of Prof. G. M. Reddy at Prof. G.M. Reddy Centre for Plant Molecular Biology, Osmania University, Hyderabad prior to joining as Lecturer at University of Hyderabad. She is presently Professor in the Department of Plant Sciences, School of Life Sciences, University of Hyderabad. She is the Elected Fellow of Telangana Academy of Sciences for the year 2017. She was awarded Biotechnology Overseas Associateship by Department of Biotechnology, New Delhi for training and research in plant genomics during March to September 2008 under Prof. Umesh Kumar Reddy as host at West Virginia State University, U.S.A. She has published 36 research articles in peer-reviewed journals and contributed 8 articles/book chapters for proceedings, post-graduate diploma courses and Dr. B. R. Ambedkar Open University. She has guided 10 Ph.D. students and one M.Phil. student for their thesis works. She mentored 3 students for post-doctoral Fellowships. The present research team consists of 4 Ph.D. students.

Her group is engaged in research in various aspects of plant biology and biotechnology that includes melatonin-mediated drought stress tolerance, individual and interactive effects of melatonin and methylglyoxal in regulation of autophagy and leaf senescence, sex identification using molecular markers, molecular genetic diversity analysis, characterization of bioactive compounds and their enhancement using *in vitro* approaches, biochemical and molecular insights of seed dormancy and germination, and heterosis in economically important plant species. The major research accomplishments during the last decade have been development of molecular marker for sex identification in *Simarouba glauca* and improved method for rapid production of seedlings in *Givotia moluccana* which shows poor seed germination due to long seed dormancy. Her group identified an important compound viz., benzoylsalicylic acid and showed that it is a new inducer of systemic acquired resistance in plants. The group has advanced the scientific information on seed dormancy and germination in *Givotia moluccana*; heterosis in maize; enhanced the production of phenolics and flavonoids in callus cultures of *G. moluccana* by elicitation with salicylic acid and jasmonic acid and melatonin mediated drought stress tolerance in cotton and groundnut at the biochemical/physiological and molecular levels.

Currently, research is directed towards generation of molecular resources, molecular-marker based characterization of genetic diversity, and isolation of bioactive compounds and enhancement by elicitation based approaches in *Pterocarpus santalinus*. The research group is also working on understanding the hormetic response of methylglyoxal with or without melatonin using biochemical, physiological and molecular approaches in cotton. The research work in her lab has been supported by DST, UGC, CSIR and DBT with the ongoing research activities being supported by Indian Council of Forest Research Education (ICFRE, Dehradun) under CAMPA, and UGC-Institute of Eminence (IoE) of University of Hyderabad.

Teaching:

- Eukaryotic Genetics (for M.Sc. Plant Biology and Biotechnology; M.Sc. Molecular Microbiology; M.Sc. Animal Biotechnology; M.Sc. Biochemistry; Integrated M.Sc./Ph.D. Biochemistry; M.Sc. Biotechnology; Integrated M.Sc. Biology for Plant Biology and Biotechnology, Integrated M.Sc. Biology for Microbiology, Integrated M.Sc. Biology for Biochemistry, Integrated M.Sc. Biology for Animal Biotechnology).
- *In Vitro* Plant Biology – M.Sc. Plant Biology and Biotechnology.

Present Research Team:

Ph.D. students working: 4

- Mr. Supriya Laha
- Ms. Priyanka Saxena
- Mr. Litu Malik
- Ms. Dake Deepika

M.Sc. students working: 2

- Ms. Archana – M.Sc. Plant Biology and Biotechnology
- Ms. Richa Lobiyal – M.Sc. Plant Biology and Biotechnology

Former Ph.D. students and their employment details:

Name of the Student	Year of Ph.D. Degree Awarded	Current Position
Dr. A. Roja Rani	2002	Professor, Department of Genetics, Osmania University, Hyderabad 500 007, Telangana, India.
Dr. D. S. Vijaya Chitra	2003	Lecturer in Botany, Department of Life Sciences, The University of the West Indies, Mona, Jamaica.
Dr. Madhumita Bowmik	2008	Assistant Professor, Dasaratha Deb Memorial College, Khowai, Tripura.
Dr. M. Haritha	2010	Presently in U.S.A., Details of employment are not available.
Dr. M. Sujatha	2014	Lecturer in Botany, Telangana Social Welfare Residential Educational Institutions Society, Zone VI, Armoor Mandal, Nizamabad District, Telangana (Passed away in 2021).
Dr. T. Latha	2015	Worked as Team Head, OMICS International, e-Book Processing and Publishing from May 2017 to March 2019. (Resigned the job as she had to move to Rajasthan to accompany her husband).
Dr. P. Durgeshwar	2020	Post-doctoral Fellow, Department of Life Sciences, Ben-Gurion University in the Negev, Israel.
Dr. Rajesh Kumar Meena	2020	Research Associate-1, working with Dr. Rajeev Nain Bharguna, National Agri-Food Biotechnology Institute, Sahibzada Ajit Singh Nagar, Punjab, India.
Dr. B. Madhavi	2021	Research Scientist, Proleri Technologies Pvt. Ltd. BIONEST, School of Life Sciences, South Campus, University of Hyderabad, Hyderabad, India.
Dr. Nyanthanglo Woch	2024	Awarded Ph.D. degree in May 2024. Applying for Post-doctoral positions. Worked in IoE-Research Project of Prof. G. Padmaja.

Publications: 36

1. Supriya L, Dake D, Muthamilarasan M, and **Padmaja G** (2024) Melatonin-mediated regulation of autophagy is independent of ABA under drought stress in sensitive variety of *Gossypium hirsutum* L. *Plant Physiology and Biochemistry*. 207: 108409, 1-8.
2. Gahir S, Bharath P, Saini D, **Padmaja G**, and Raghavendra AS (2024) Role of mitochondria and chloroplast during stomatal closure: Subcellular location of superoxide and H₂O₂ production in guard cells of *Arabidopsis thaliana*. *Journal of Biosciences*. 49: 44, 1-14.
3. Gupta P, Parupudi PLC, Supriya L, Srivastava H, **Padmaja G**, and Gopinath K (2023) Complete genome sequencing and construction of full-length infectious cDNA clone of papaya ringspot virus-HYD isolate and its efficient *in planta* expression. *Frontiers in Microbiology*. 14: 1310236, 1-12.
4. Nyanthanglo W, Supriya L, and **Padmaja G** (2023) Salicylic acid and jasmonic acid induced enhanced production of total phenolics, flavonoids and antioxidant metabolism in callus cultures of *Givotia moluccana* (L.) Sreem. *In Vitro Cellular and Developmental Biology – Plant*. 59: 227-248.
5. Shreya S, Supriya L, and **Padmaja G** (2022) Melatonin induces drought tolerance by modulating lipoxygenase expression, redox homeostasis and photosynthetic efficiency in *Arachis hypogaea* L. *Frontiers in Plant Science*. 13: 1069143, 1-22.
6. Supriya L, Durgeshwar P, Muthamilarasan M, and **Padmaja G** (2022) Melatonin mediated differential regulation of drought tolerance in sensitive and tolerant varieties of upland cotton (*Gossypium hirsutum* L.). *Frontiers in Plant Science*. 13: 821353, 1-22.
7. Jyothi Chaitanya P, Suresh Y, and **Padmaja G**. (2021) Anti-diabetic activity of partially purified santalin A from the heartwood of *Pterocarpus santalinus* L.f. in alloxan-induced diabetic Wistar rat. *Journal of Endocrinology and Reproduction*. 25: 65-78.
8. Rajesh Kumar M, Kanubothula SR, Ranjana G, Surender M, Attipalli AR and **Padmaja G** (2021) Improved photosynthetic characteristics correlated with enhanced biomass in a heterotic F₁ hybrid of maize (*Zea mays* L.). *Photosynthesis Research*. 147: 253-267.
9. Durgeshwar P, Rajesh Kumar M, Swaroopa TR, and **Padmaja G** (2020) Proteomic analysis of differentially abundant proteins in the embryo and endosperm of *Givotia moluccana* (L.) Sreem. *Journal of Forestry Research*. 31: 2097-2109.
10. Rajesh Kumar M, Durgeshwar P, and **Padmaja G** (2018) Proteomic analysis of heterotic seed germination in maize using F₁ hybrid DHM 117 and its parental inbreds. *Turkish Journal of Biology*. 42: 345-363.
11. Samuel K, Reddanna P, Anil Kumar P, Surya Satyanarayana S, and **Padmaja G** (2017) Benzoylsalicylic acid derivatives as defense activators in tobacco and Arabidopsis. *Phytochemistry*. 143: 160-169.
12. Madhavi B, Latha T, and **Padmaja G** (2017) Efficient *in vitro* plant regeneration from seedling-derived explants and genetic stability analysis of regenerated plants of *Simarouba glauca* DC. by RAPD and ISSR markers. *In Vitro Cellular and Developmental Biology - Plant*. 53: 50-63.
13. Vijaya Chitra DS, Chinthapalli B, and **Padmaja G** (2017) Protein difference among the leaf explants determined for shoot regeneration and callus growth in mulberry (*Morus indica* L.). *Research in Biotechnology*. 8: 1-11.

14. Samuel K, Kishore Babu N, Anil Kumar P, Reddanna P, Surya Satyanarayana S, and **Padmaja G** (2016) Benzoylsalicylic acid isolated from seed coats of *Givotia rottleriformis* induces systemic acquired resistance in tobacco and Arabidopsis. *Phytochemistry*. 126: 11-22. (Impact Factor: 4.004).
15. Vijaya Chitra DS, Chinthapalli B, and **Padmaja G** (2016) A comparative study of field performance of micropropagated plants and stem cutting derived plants of S-36 cultivar of mulberry (*Morus indica* L.). *Research in Biotechnology*. 7: 21-27.
16. Samuel K, Naresh K, and **Padmaja G** (2015) Isolation and characterization of gallic acid and methyl gallate from the seed coats of *Givotia rottleriformis* Griff. and their anti-proliferative effect on human epidermoid carcinoma A431 cells. *Toxicology Reports*. 2: 520-529.
17. Dey D, Uma B, **Padmaja G**, and Podile AR (2014) Pathogen-induced expression of harpin_{PSS} increases resistance in tobacco against *Fusarium oxysporum* f. sp. *Nicotianae*. *Journal of Plant Pathology*. 96: 335-342.
18. Vijaya Chitra DS, Bhaskarrao C, **Padmaja G** (2014) Efficient regeneration system for genetic transformation of mulberry (*Morus indica* L. cultivar S-36) using *in vitro* derived shoot meristems. *American Journal of Plant Sciences*. 5: 1-6.
19. Shukla SP, and **Padmaja G** (2013) *In vitro* regeneration from shoot tip and nodal explants of *Simarouba glauca* DC., a promising biodiesel tree. *International Journal of Applied Biology and Pharmaceutical Technology*. 4: 206-213.
20. Samuel K, Rajesh Y, and **Padmaja G** (2012) Temperature pre-treatment of seeds for overcoming zygotic embryo dormancy of *Givotia rottleriformis* Griff. under *in vitro* conditions. *The Asian and Australasian Journal of Plant Science and Biotechnology*. 6: 19-23.
21. Latha T, and **Padmaja G** (2012) RAPD analysis for detection of genetic variability and sex in *Givotia rottleriformis* Griff. *Tree and Forestry Science and Biotechnology*. 6: 108-115.
22. Samuel K, Debashish D, Madhumita B, **Padmaja G**, Siva Ram Prasad, Bhaskara Ramana Murthy V, and Rao PS (2009) *In vitro* germination and micropropagation of *Givotia rottleriformis* Griff. *In Vitro Cellular and Developmental Biology - Plant*. 45: 466-473.
23. Venkatesh K, Roja Rani A, Nirmala Baburao, and **Padmaja G** (2009) Effect of auxins and auxin polar inhibitor in groundnut (*Arachis hypogaea* L.). *African Journal of Plant Science*. 3: 288-293.
24. Roja Rani A, Venkateswarlu P, Arun Kumar, **Padmaja G**, Nirmala Baburao (2009) Polypeptides associated with the induction and maturation of direct somatic embryogenesis in peanut (*Arachis hypogaea* L.). *African Journal of Biotechnology*. 15: 3463-3471.
25. Roja Rani A, Venkateswarlu P, **Padmaja G**, Venkatesh K, and Nirmala Baburao (2009) Changes in protein composition and protein phosphorylation during somatic embryogenesis and plant regeneration in peanut (*Arachis hypogaea* L.). *African Journal of Biotechnology*. 15: 3472-3478.
26. Roja Rani A, Reddy VD, Prakash Babu P, and **Padmaja G** (2005) Changes in protein profiles associated with somatic embryogenesis in groundnut (*Arachis hypogaea* L.). *Biologia Plantarum*. 49: 347-354.

27. Roja Rani A, and **Padmaja G** (2005) A protocol for high frequency plant conversion from somatic embryos of peanut (*Arachis hypogaea* L. cv. DRG-12). *Journal of Plant Biotechnology*. 7: 187-193.
28. Beena MR, Jami SK, Srinivasan T, Swathi Anuradha T, **Padmaja G**, and Kirti PB (2005) An efficient direct shoot regeneration from cotyledonary node explants of peanut (*Arachis hypogaea* L. cv. JL-24). *Indian Journal of Plant Physiology*. 10: 205-210.
29. Sriyans Jain, and **Padmaja, G.** (2004) Induction of maturation proteins in germinating seeds of groundnut (*Arachis hypogaea* L.) by exogenous application of ABA and NaCl. *Indian Journal of Plant Physiology*. 9: 343-347.
30. Vijaya Chitra DS, and **Padmaja G** (2005) Shoot regeneration *via* direct organogenesis from *in vitro* derived leaves of mulberry using thidiazuron and 6-benzylaminopurine. *Scientia Horticulturae*. 106: 593-602.
31. Vijaya Chitra DS and **Padmaja G** (2002) Seasonal influence on axillary bud sprouting and micropropagation of elite cultivars of mulberry. *Scientia Horticulturae*. 92: 55-68.
32. Vijaya Chitra DS, and **Padmaja G** (1999) Clonal propagation of mulberry (*Morus indica* L. Cultivar M-5) through *in vitro* culture of nodal explants. *Scientia Horticulturae*. 80: 289-298.
33. **Padmaja G**, Reddy RL, and Reddy GM (1995) Plant regeneration from synthetic seeds of groundnut, *Arachis hypogaea* L. *Indian Journal of Experimental Biology*. 33: 967-971.
34. **Padmaja, G**, Reddy VD, and Reddy GM (1993) Somaclonal variation from regenerants of mature embryo callus cultures of triticale. *Indian Journal Experimental Biology*. 31: 238-241.
35. **Padmaja G**, Reddy VD, and Reddy GM (1992) Somatic embryogenesis and plant regeneration from mature embryo callus cultures of triticale. *Indian Journal of Experimental Biology*. 30: 181-184.
36. **Padmaja G**, Tejovathi G, and Anwar SY (1990) Anatomical studies on certain *in vitro* induced abnormal variants in safflower (*Carthamus tinctorius* L.). *Phytomorphology*. 40: 233-241.

Research Projects Ongoing:

1. Principal Investigator of the Research Project on “Decoding the mechanism of melatonin-induced delayed leaf senescence and its relationship with autophagy in upland cotton (*Gossypium hirsutum* L.) under drought stress conditions” sanctioned by the University of Hyderabad-Institution of Eminence (UoH-IoE), University Grants Commission, 2021-2024. (Rs. 40.78 lakhs).
2. Principal Investigator of the All India Coordinated Research Project on “Conservation and productivity improvement of red sanders (*Pterocarpus santalinus* L.f.)” with Dr. S. Pattanaik as National Project Coordinator, sanctioned by Indian Council of Forestry Research and Education (ICFRE), Dehradun, Funded by CAMPA. 2020-2025. (Rs. 42.9 lakhs).