Asad Prodhan

BSc Ag (Hons) MS *BAU* MSc *Sydney* PhD *W. Australia*

asad.prodhan@dpird.wa.gov.au
m +61430079374
asadprodhan.github.io

Laboratory Scientist
DPIRD Diagnostics and Laboratory Services
Department of Primary Industries and Regional Development
3 Baron-Hay Court, South Perth WA 6151, Australia
&
Adjunct Senior Lecturer
School of Biological Sciences
The University of Western Australia
35 Striling Highway, Crawley WA 6009, Australia

Key Competencies

Research

- Plant nutrition physiology (phosphorus, nitrogen, sulfur, micronutrients)
- Plant nutrition biochemistry, metabolomics and transcriptomics
- Plant nutrient transport with specialisation in nitrate transport
- Plant experimentation in hydroponics, glasshouse, and field
- Plant physiological methods and approaches (elemental assays, SPAD-520 and LiCor)
- Plant molecular methods: DNA and RNA extraction, cDNA synthesis, Quantitative real-time polymerase chain reaction (qPCR), PCR, DNA library preparation, Next Generation Sequencing
- Genome- and transcriptome-wide nitrate transport gene sequence analysis
- Phosphorus- and nitrogen-specific metabolite assay
- Soil microbiome analysis to study soil-plant-microbe interactions with the view to developing innovative technologies related to plant nutrition that will benefit sustainable agricultural production
- Bioinformatics programming and supercomputing for microbial big data analysis

Teaching

- **Co-supervisor**, 2025-2028. **Ms Xiaowen Fan**, **PhD Student**, School of Biological Sciences, The University of Western Australia, Thesis title “Unravelling phosphorus acquisition mechanisms in wheat intercropped with contrasting chickpea lines”
- **Co-supervisor**, 2025. **Mr Putta Bala Sai Vignesh Babu**, **MSc Student**, School of Biological Sciences, The University of Western Australia, Thesis title “Genomics of chloroplast and mitochondrial biogenesis during leaf greening in a phosphorus-efficient plant”
- **Co-supervisor**, 2024. **Mrs Shompa Akter**, **MSc Student**, UWA School of Agriculture and Environment, The University of Western Australia, Thesis title “Exploring soil amelioration effects on wheat growth, nutrition, and microbial biomass carbon in sandy soil”
- **Co-supervisor**, 2024. **Mr Luc Shepherd**, **Hons Student**, Research School of Biology, Australian National University, Thesis title “High-throughput surveillance, diagnostic and tracing assays for the fungal pathogen *Austropuccinia psidii*”
- Demonstrator, 2009, **First Year Biology Teaching Labs**, School of Biological Sciences, The University of Sydney
- Demonstrator, 2016-2017, **First Year Biology (Course: Frontiers in Biology) Teaching Labs**, School of Biological Sciences, The University of Western Australia

Outreach

- Conducted **Nanopore Sequencing for Biosecurity** workshop at Curtin University in 2023
- Regularly organising hands-on programming and bioinformatics workshops for PhD research students at The University of Western Australia
- Serve as a journal review editor and reviewer

- Served as a Vice-President and Secretary of a student body at The University of Western Australia named “The University of Western Australia Society of Bangladeshi Culture (USBC)” in 2014-2015

Selected Publications

- Rice transcriptomics (phosphorus), *Scientific Reports* 2022
- Plant nutrition (review), *Trends in Plant Science* 2018
- Plant nutrition (Sulfur), *New Phytologist* 2017
- Plant nutrition (nitrogen), *Plant, Cell and Environment* 2016

Education

PhD (Molecular Plant Physiology) 2017
School of Biological Sciences, University of Western Australia
Dissertation: Tight control of nitrogen and sulfur assimilation is an adaptive mechanism for *Hakea pro strata*, a plant from a severely phosphorus-impoverished habitat.
Supervisors: E/Prof Hans Lambers and E/Prof Patrick Finnegan

MSc (Molecular Biology) 2012
School of Biological Sciences, University of Sydney, Australia
Dissertation: Genotypic variation in cotton root system architecture
Supervisors: Dr Jenny Saleeba and Associate Professor Peter McGee

MS (Genetics & Plant Breeding) 2006
Bangladesh Agricultural University, Bangladesh
Dissertation: Optimization of transformation protocol in *Brassica* spp. using *Agrobacterium*.
Result: Distinction (A+; GPA 4.0 out of 4.0)
Supervisor: Professor Lutful Hasan

BSc Agriculture (Honours) 2005
Bangladesh Agricultural University, Bangladesh
Result: First class

Employment

Laboratory Scientist
2021- Present
Department of Primary Industries and Regional Development
Government of Western Australia
Key responsibilities:

- Developing bioinformatics analysis pipelines for microbial DNA data
- High Performance Computing for large scale microbial DNA data
- Computational programs such as Nextflow, Singularity, Bash, Python, and R
- Oxford Nanopore Technology and Illumina sequencing
- Genome assembly using short and long reads
- Genomics- bacteria, archaea, virus, viroid, fungus, and insect
- Molecular Biology- DNA/RNA extraction, PCR/qPCR, library preparation
- Bioinformatics workshop and hands-on training for the students and early career researchers
- Supervision of research student
- Participating in national ring tests for bioinformatics analysis pipelines

Adjunct Senior Lecturer
2024 – present
School of Biological Sciences, University of Western Australia
Key responsibilities:

- Co-supervising Ms Xiaowen Fan, PhD Student, School of Biological Sciences, The University of Western Australia, Thesis title "Unravelling phosphorus acquisition mechanisms in wheat intercropped with contrasting chickpea lines", 2025-2028.
- Co-supervising Mr Putta Bala Sai Vignesh Babu, MSc Student, School of Biological Sciences, Thesis title "Genomics of chloroplast and mitochondrial biogenesis during leaf greening in a phosphorus-efficient plant", 2025
- Co-supervising Mrs Shompa Akter, MSc Student, UWA School of Agriculture and Environment, The University of Western Australia, Thesis title "Exploring soil amelioration effects on wheat growth, nutrition, and microbial biomass carbon in sandy soil", 2024

Adjunct Senior Lecturer
2024 – present
College of Environmental and Life Sciences, Murdoch University
Key responsibilities:

- Guest lecturing in microbial genomics undergraduate teaching labs
- Mentoring PhD students- Mrs Mahfuza Akhter, Mr Ashiqur Rahman and Mr Eaftekhar Ahmed Rana- for the microbial component of their PhD research

Holder of prestigious JSPS (Japan Society for the Promotion of Science) Postdoctoral Research Fellowship
2019- 2021
Japan International Center for Agricultural Sciences, Tsukuba, Japan
Key responsibilities:

- RNA-seq analysis to determine transcriptional responses of rice (*Oryza sativa*) to phosphorus stress
- Identifying QTL for phosphorus-efficient root traits in rice

Molecular Biologist
2017 - 2019
Department of Primary Industries and Regional Development, South Perth, Western Australia
Key responsibilities:

- PCR and qPCR for gene expression profiling
- Library preparation for Illumina and Nanopore sequencing
- LAMP assay to detect targeted genes

Adjunct Research Fellow
2018 – 2024
School of Biological Sciences, University of Western Australia

- **Key responsibilities:** Determining nitrate transporter genes in *Hakea prostrata*
- *Hakea prostrata* genome and transcriptome sequence analysis

Research Officer
2016-2018
School of Biological Sciences, University of Western Australia
Key responsibilities:

- *Hakea prostrata* genome and transcriptome sequence analysis to identify nitrate transporter genes
- Supervising Honours students

Demonstrator, Frontiers in Biology,
2016 – 2017
School of Biological Sciences, University of Western Australia, Australia
Key responsibilities:

- Teaching and supervising undergraduate students in a first-year biology lab

Visiting Postgraduate Researcher
2014
Max Planck Institute of Molecular Plant Physiology, Potsdam, Germany
Key responsibilities:

- Determining metabolic adaptation of plants to phosphorus-impoverished soils

Demonstrator, Molecular Biology,
2009
School of Biological Sciences, University of Sydney, Sydney, Australia
Key responsibilities:

- Teaching and supervising undergraduate students in a first-year biology lab

Research Associate
2007-2008
Dept. of Genetics and Plant Breeding, Bangladesh Agricultural University, Mymensingh, Bangladesh
Key responsibilities:

- Studying *Agrobacterium-mediated* genetics transformation in rapeseed crop to develop a salt tolerant variety

Research Assistant
2005-2007
Dept. of Genetics and Plant Breeding, Bangladesh Agricultural University, Mymensingh, Bangladesh
Key responsibilities:

- Studying in vitro regeneration potentiality of different Brassica genotypes

Secured Funding

Year	Funding	Purpose	Funding Body
2019	JPY 2 Million	Research	Japan Society for the Promotion of Science
2015	USD 500	Conference Travel	Penn State University, USA
2015	AUD 500	Conference Travel	University of Western Australia
2014	AUD 2500	Research Travel	University of Western Australia
2013	AUD 120,000	PhD Scholarship	Govt of Commonwealth of Australia at UWA
2010	AUD 450	Conference Travel	Australian Society of Plant Scientist (ASPS)
2010	AUD 1200	Conference Travel	School of Biological Sciences, Sydney Uni.
2008	AUD 94,000	Masters Scholarship	Govt. of Commonwealth of Australia at USyd

Publications

1. Pariasca-Tanaka, J., Ueda, Y., Kondo, K., **Prodhan, M.A.**, Rajonandraina, T., Ranaivo, H.N., Rakotondramanana, M.F., Saito, H., Thi Dinh, L., Wissuwa, M., 2025. Genome-wide sequence comparison and development of InDel and SNP markers to facilitate localized rice breeding. Curr. Plant Biol. 42, 100469. https://doi.org/10.1016/j.cpb.2025.100469
2. Nestor BJ, Bird T, Severn-Ellis AA, Bayer PE, Ranathunge K, **Prodhan MA**, et al. Identification and expression analysis of Phosphate Transporter 1 (PHT1) genes in the highly

phosphorus-use-efficient *Hakea prostrata* (Proteaceae). Plant, Cell & Environment. **2024**. doi:10.1111/pce.15088

3. **Prodhan MA**, Ueda Y, Wissuwa M. Comparative root transcriptome analysis suggests down-regulation of nitrogen assimilation in DJ123, a highly phosphorus-efficient rice genotype | bioRxiv. **2024**. Available: https://www.biorxiv.org/content/10.1101/2024.04.18.590184v1.abstract
4. **Prodhan MA**, Power M, Kehoe M. sangerFlow, a Sanger sequencing-based bioinformatics pipeline for pests and pathogens identification. bioRxiv. **2024**. doi:10.1101/2024.05.10.593518
5. Vala HR, Bochow S, Kehoe M, **Prodhan A**, Davis R. First report of Sri Lankan cassava mosaic virus in Australia. Australasian Plant Dis Notes. **2024**;19: 23. doi:10.1007/s13314-024-00546-1
6. Luo, Z., Feng, J., Bird, A., Moeller, M., Tam, R., Shepherd, L., Murphy, L., Singh, L., Graetz, A., Amorim, L., Massola Júnior, N. S., **Prodhan, M. A**., Shuey, L. S., Beattie, D., Gonzalez, A. T., Tobias, P., Padovan, A., Kimber, R. B. E., McTaggart, A. R., … Boufleur, T. R. (**2024**). Eight novel diagnostic markers differentiate lineages of the highly invasive myrtle rust pathogen Austropuccinia psidii. Plant Disease. https://doi.org/10.1094/PDIS-10-24-2111-SR
7. Jinghang, F., Austin, B., Zhenyan, L., Rita, T., Luc, S., Lydia, M., Lavi, S., Abigail Graetz, M. M., Lilian, A., Nelson, S. M. J., **Prodhan, M.A.**, Louise, S., Douglas, B., Alejandro, T. G., Tobias, P.A., Amanda, P., Rohan, K., Alistair, M., …Boufleur, T.R., **2024**. Mating-compatibility genes employed as diagnostic markers to identify novel incursions of the myrtle rust pathogen *Austropuccinia psidii*, **BioRxiv**, https://doi.org/10.1101/2024.02.19.580897.
8. Zaman, M. S. U., Malik, A. I., Luna, L. N., Hossain, M. A., Alam, A. K. M. M., **Prodhan, M. A.**, & Erskine, W., **2024**. Differences of waterlogging tolerance in winter pulse crop between emergence and vegetative stages. **Journal of Agronomy and Crop Science**, 210(2), e12704. https://doi.org/10.1111/jac.12704
9. **Prodhan, M.A.**, Widmer, M., Kinene, T., Kehoe, M., 2023. Whole mitochondrial genomes reveal the relatedness of the browsing ant incursions in Australia. ***Scientific Reports*** 13, 10273. https://doi.org/10.21203/rs.3.rs-2726670/v1.
10. **Prodhan, M.A.**, Pariasca-Tanaka, J., Ueda, Y., Hayes, P.E., Wissuwa, M., 2022. Comparative transcriptome analysis reveals a rapid response to phosphorus deficiency in a phosphorus-efficient rice genotype. ***Scientific Reports*** 12, 9460. https://doi.org/10.1038/s41598-022-13709-w.
11. Heredia, M.C., Kant, J., **Prodhan, M.A.**, Dixit, S., Wissuwa, M., 2022. Breeding rice for a changing climate by improving adaptations to water saving technologies. ***Theoretical and Applied Genetics.*** 135, 17–33. https://doi.org/10.1007/s00122-021-03899-8.
12. Huda M, Nuruzzaman M, Ferdausi A, **Prodhan M.A.**, Hossain A. 2019. Characterization of salt tolerance in rice landraces (Oryza sativa L.) at seedling stage. ***Indian Journal of Natural Sciences*** 10(56): 17613-17629.
13. Alam MA, Syazwanie NF, Mahmod NH, Badaluddin NA, Mustafa KA, Alias N, Aslani F, **Prodhan MA.** 2018. Evaluation of antioxidant compounds, antioxidant activities and capsaicinoid compounds of Chili (*Capsicum* sp.) germplasms available in Malaysia. ***Journal of Applied Research on Medicinal and Aromatic Plants*** 9: 46-54.
14. **Prodhan M.A.**, Finnegan P.M. & Lambers H. 2018. How does evolution in a severely phosphorus-impoverished landscape impact the control of plant nitrogen and sulfur assimilation? ***Trends in Plant Science*** 24(1):69-82.
15. **Prodhan M.A.**, Jost R., Watanabe M., Hoefgen R., Lambers H. & Finnegan P.M. 2017. Tight control of sulfur assimilation: an adaptive mechanism for a plant from a severely phosphorus-impoverished habitat. ***New Phytologist*** 215, 1068-1079.
16. **Prodhan M.A.**, Jost R., Watanabe M., Hoefgen R., Lambers H. & Finnegan P.M. 2016. Tight control of nitrate acquisition in a plant species that evolved in an extremely phosphorus-impoverished environment. ***Plant, Cell and Environment*** 39: 2754-2761.

17. **Prodhan M.A.**, Hassan L. & Talukder S.K. 2008. Study of *in vitro* regeneration potentiality of ten Brassica genotypes (from *Brassica campestris*, *Brassica napus* and *Brassica juncea*). ***Bangladesh Journal of Progressive Science & Technology*** 6(1): 9-12.
18. Ghosal, S.; Hassan L., Biswas P. L. & **Prodhan M.A**. 2008. *In vitro* regeneration of *Brassica* species (Rapeseed, Mustard and Cole Crops). ***Bangladesh Journal of Agricultural Science*** 35(1).
19. Kamal A.H.M., Alam M.A., Pervin N., **Prodhan M.A.**, & Patwary A.K. 2008. Varietal responses in different concentration of plant growth regulators for callus induction and regeneration of wheat. ***International Journal of BioResearch*** 4(3):26-32.
20. Alam M.A., Kamal A.H.M., Pervin N., Khatun S. & **Prodhan M.A.** 2008. *In vitro* plantlet regeneration through anther and filament culture in oilseed Brassica. ***International Journal of BioResearch*** 4(4):12-18.
21. Basak S., Alam M.A., Sultana S., **Prodhan M.A.**, Dey R.C. & Hassan L. 2008. Studies on callus induction and plant regeneration potentialities of indica rice varieties. ***International Journal of BioResearch*** 4(4):128-134.
22. **Prodhan M.A.**, Hassan L. & Talukder S. K. 2007. Optimization of *Agrobacterium* mediated genetic transformation protocol in two important Brassica varieties (Safal and Tori-7) of Bangladesh. Bangladesh ***Journal of Crop Science*** 18 (2): 265-272.
23. Mondal S.R., Hassan L., Sarker P.K. & **Prodhan M.A.** 2007. *In vitro* regeneration of chickpea (*Cicer arietinum* L.) genotypes using seed and seedling explants. ***Bangladesh Journal of Agricultural Science*** 34(2): 169-176.

Conference Presentations

1. **Prodhan, M.A. 2023**. Why do we bring genomics to biosecurity? Bently Agricultural and Biological Seminar Series (BABSS). 07 July 2023, Centre for Crop Disease Management, **Curtin University, Perth, Australia**.
2. **Prodhan, M.A.**, Widmer, M., Kinene, T., Kehoe, M. **2023**. Application of nanopore sequencing in Biosecurity surveillance. London Calling 2023. 17-19 May 2023, Virtual, **London, UK**.
3. **Prodhan, M.A.**, Widmer, M., Kinene, T., Kehoe, M. **2022**. Why bring genomics into biosecurity? 22 AMSI BioInfoSummer, A Symposium in Bioinformatics. 21-24 November 2022, Virtual, **University of Melbourne, Melbourne, Australia**.
4. **Prodhan, M.A.**, Webster, C., Wright, D., Wang, C., Bwye, A., Kehoe, M. **2022**. Improving MALDI-TOF bacterial species identification by nanopore whole genome sequencing. The 2022 Annual Diagnostics and Surveillance Workshop (ADSW). 30 August - 1 September 2022, Virtual, AgriBio at **La Trobe University, Melbourne, Australia**.
5. **Prodhan, M.A.**, Widmer, M., Kinene, T., Kehoe, M. **2021**. Browsing ant diagnostic using the high-throughput sequencing. 23rd Biennial Australasian Plant Pathology Society Conference. 23-26 November 2021, **Virtual, Australia**.
6. **Prodhan M.A.**, Jost, R., Lambers, H. & Finnegan, P.M. **2015**. Cross-talk between phosphate and nitrate metabolism in *Hakea prostrata*. 20th Penn State Plant Biology Symposium. 13-16 May 2015, **Penn State University, PA, USA**.
7. **Prodhan, M.A.**, Finnegan, P.M., Lambers, H. & Jost, R. **2014**. Phosphorus Use Efficiency in *Hakea prostrata*: Role of other Nutrients. Phosphorus in Soils and Plants 5. 26-29 August 2014, **Montpellier, France**.
8. **Prodhan, M.A.**, Finnegan, P.M., Lambers, H. & Jost, R. **2013**. Molecular Responses of *Hakea prostrata* to Changes in Mineral Nutrition. International Conference, ComBio 2013. 29 September – 3 October 2013, **Perth, Australia**.
9. **Prodhan, M.A.**, McGee, P.A. & Saleeba, J.A. **2010**. Genetics of Primary Root Branching in Cotton. International Conference on “Molecules of life: from discovery to biotechnology”. 26 September - 1 October 2010 in **Melbourne, Australia**.

10. **Prodhan, M.A.**, McGee, P.A. & Saleeba, J.A. **2010**. Candidate Genes for Root System Architecture in Cotton. Annual Conference of Genetics Society of AustralAsia. 4 - 8 July 2010 in **CSIRO**, **Canberra, Australia**.
11. **Prodhan, M.A.**, Alomari, O.K., Ly, P.K.C., McGee, P.A. & Saleeba, J.A. **2009**. Root System Architecture in Cotton. International Plant Phenomics Symposium: from Gene to Form and Function. 21 - 24 April 2009 in **CSIRO, Canberra, Australia**.

Teaching Experiences

Current	PhD Plant Nutrition	**Co-supervisor,** School of Biological Sciences, University of Western Australia, Australia **Thesis:** Unravelling phosphorus acquisition mechanisms in wheat intercropped with contrasting chickpea lines
Current	MSc Bioinformatics	**Co-supervisor,** School of Biological Sciences, University of Western Australia, Australia **Thesis:** Genomics of chloroplast and mitochondrial biogenesis during leaf greening in a phosphorus-efficient plant
2024	MSc Plant Nutrition	**Co-supervisor,** UWA School of Agriculture and Environment, University of Western Australia, Australia **Thesis:** Exploring soil amelioration effects on wheat growth, nutrition, and microbial biomass carbon in sandy soil
2023	Workshop	**Instructor,** Workshop for Nanopore Sequencing for Biosecurity. Centre for Crop Disease Management, Curtin University, **Perth, Australia.**
2023	Honours	**Co-supervisor,** Research School of Biology, Australian National University, Canberra, Australia **Thesis:** High-throughput identification and quantification of the air-borne fungal pathogen A*ustropuccina psidii.*
2017	Honours	**Supervisor,** School of Biological Sciences, University of Western Australia, Australia Plant nutrition lab
2016 – 2017	Undergraduate	**Demonstrator, Frontiers in Biology**, School of Biological Sciences, University of Western Australia, Australia Undergraduate teaching lab
2016	Undergraduate	**Supervisor, Field Laboratory, Plant Physiological Ecology** School of Biological Sciences, University of Western Australia, Australia Undergraduate field research
2009	Undergraduate	**Demonstrator, Molecular Biology**, School of Biological Sciences, University of Sydney, Sydney, Australia Undergraduate teaching lab

Scholarships and Awards

2019-2021	JSPS (Japan Society for the Promotion of Science) Postdoctoral Fellowship, **Awarded by the Australian Academy of Science and the Government of Japan**
2016	PhD Completion Scholarship, **Awarded by the University of Western Australia**
2015	Conference Travel Award**, Awarded by the Penn State University, USA**
2015	Postgraduate Travel Award**, Awarded by the University of Western Australia**
2014	Convocation Research Travel Award**, Awarded by the University of Western Australia**
2013- 2016	Safety Net Top-Up Scholarship**, Awarded by the University of Western Australia**

2013- 2016	Australian Postgraduate Award, **Awarded by the Commonwealth of Australia**
2013- 2016	International Postgraduate Research Scholarship, **Awarded by the University of Western Australia**
2010	Conference Travel Award, **Awarded by the Australian Society of Plant Scientist (ASPS)**
2010	Postgraduate Conference Travel Grant, **Awarded by the School of Biological Sciences, the University of Sydney**
2008-2012	International Postgraduate Award, **Awarded by the University of Sydney**
2008-2012	Endeavour International Postgraduate Research Scholarship, **Awarded by the Commonwealth of Australia**
2006	**Gold Medal** for achieving distinction at the degree of Master of Science in Genetics and Plant Breeding, Bangladesh Agricultural University, Bangladesh Thesis: Optimization of transformation protocol in *Brassica* spp. using *Agrobacterium*. GPA 4.0 out of 4.0.

Professional Memberships

- Australian Society of Plant Scientist (ASPS)

Review and Editorial Activities

- Review Editor, Frontiers in Plant Science
- Reviewer, Plant and Soil
- Reviewer, Frontier in Plant Science
- Reviewer, PLOS One
- Scientific Abstract Review Committee Member, 17th Australasian Plant Breeding Conference, 4-6 June 2025, Esplanade Hotel Fremantle, Perth, WA, Australia

Personal Information

Nationality: Australian and Bangladeshi (dual citizen)

Referees

PhD Supervisor
Emeritus Professor Hans Lambers
School of Biological Sciences (M084)
The University of Western Australia
35 Stirling Highway, Crawley, WA 6009, Australia
Phone: +61 8 6488 7381, E-mail: hans.lambers@uwaedu.au

PhD Supervisor
Emeritus Professor Patrick Finnegan
School of Biological Sciences (M084)
The University of Western Australia
35 Stirling Highway, Crawley, WA 6009, Australia
Phone: +61 8 6488 8546' **E-mail:** patrick.finnegan@uwa.edu.au

Collaborator
Professor Kadambot Siddique
The UWA Institute of Agriculture
35 Stirling Highway, Crawley, WA 6009, Australia
Phone: +61 8 6488 7012, **E-mail:** kadambot.siddique@uwa.edu.au