

Nazrul Hisham Nazaruddin

Curriculum Vitae

Research Officer
Agri-omics and Bioinformatics Programme
Biotechnology and Nanotechnology Research Centre
Malaysian Agricultural Research and Development Institute (MARDI)
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Research Interests

Plant genetic engineering, tissue culture, molecular biology and genome editing.

Outreach Mission Statement

To address issues concerning genetically modified organisms (GMOs) via transgene-free and/or DNA-free genome editing in fruit/staple crops.

Academic Background

Bachelor of Science (BS): Double major in Biochemistry & Molecular Biology/Biotechnology and Genomics & Molecular Genetics, August 2013
Michigan State University, East Lansing, MI, U.S.A.
Cumulative GPA: 3.51/4.00
College of Natural Science Dean's List (GPA 3.50 or above): 6 semesters
Scholarship Award: Excellent Student Scheme by the Government of Malaysia

Work Experience

Research Officer (Plant Biotechnology) Molecular Transformation Laboratory Biotechnology & Nanotechnology Research Centre, MARDI	2014 - Present
Research Assistant (Proteomics) Proteomics Laboratory Biotechnology & Nanotechnology Research Centre, MARDI	2013 - 2014
Undergraduate Research Lab Assistant Plant Ecology and Evolution Laboratory (Schemske's Lab) Department of Plant Biology, Michigan State University	2012 - 2013

Research Background

A. Plant Biotechnology at MARDI (2014 – Current)

Design and conduct researches for crop improvement in the field of plant genetic engineering, tissue culture, molecular biology and bioinformatics.

Skills: *Agrobacterium*-mediated transformation, papaya & indica rice tissue culture, molecular cloning, PCR, Real-time qPCR and bioinformatics (e.g. Python, Linux, Blast2GO)

Projects involved:

1. Development of disease resistant local rice variety via gene editing technology (2019)
2. Protoplast technology: an alternative reagent delivery platform for plant genome editing (2019)
3. Development of transgenic papaya with enhanced resistance against pathogenic bacteria, *Erwinia mallotivora*, by using quorum quenching strategy (2018-19)
4. Functional analysis of Ceri Terengganu (*Lepisanthes fruticosa*) *de novo* fruit transcriptome (2018)

5. Isolation, characterization and functional validation of *PR5* gene of Tetep rice variety (*Oryza sativa* cv. Tetep). (2017)
6. Positive selection of putative transgenic papaya by using mannose. (2016 - Collaborator)
7. Development of marker-free transgenic papaya by using heat-inducible FLP/FRT recombination system. (2015)

B. Proteomics at MARDI (2013 – 2014)

Assisted researcher on pathogenomics studies of papaya dieback disease using proteomics approach.

Skills: Protein quantification using Bradford Assay, SDS PAGE, and two-dimensional SDS PAGE.

C. Plant Ecology and Evolution (Schemske's lab) at Michigan State University (2012 – 2013)

Performed general lab duties and assisted post-doctoral research associate to produce hybrid vigor by crossing two ecotypes of *Arabidopsis thaliana* from Sweden and Italy for quantitative trait loci (QTL) analysis.

Skills: *Arabidopsis* plant maintenance and crossing, PCR, gel electrophoresis, fitness analysis and data-keeping.

Related Publications

1. Rogayah, S., **Nazrul Hisham, N.**, Amin Asyraf, T., Noriha, M.A., Chien-Yeong, W., Johari, S., Nora'ini, A., Nurain Izzati, S., Roslinda, A.R. and Zaifulfarizal, Z. (2019). Enhancing Eksotika Papaya Resistance to Dieback Disease through Quorum Quenching, *J. Trop. Plant Physiol.* **11(1)**:1-9.
2. **Nazrul Hisham, N.**, Amin Asyraf, T., Adrain, L.C.K., Noriha, M.A., Rogayah, S. and Johari S. (2018). Addressing Papaya Dieback Disease through Biotechnology Approaches. *MARDI Scientia* **11**:5.
3. Rogayah, S., Rohaiza, A.R., **Nazrul Hisham, N.**, Amin, A.T., Nora'ini, A., Sew, Y.S. and Nurain, I.S. Towards the Production of Genetically Modified Rice with Resistance to Sheath Blight Disease (2017). *Trans. Malaysian Soc. Plant Physiol.* **24**:112-116. ISBN 978-967-10840-6-9
4. **Nazrul Hisham, N.**, Rogayah, S., Roslinda, A.R., Nor'aini, A. and Amin Asyraf, T. (2016) Excision of Selectable Marker Gene from Transgenic Eksotika Papaya by using Heat-inducible FLP/FRT Recombination System, *Trans. Malaysian Soc. Plant Physiol.* **23**:58-62.

Professional Qualification

- Registered Biosafety Professional (RBP0030/2017) - Malaysian Biosafety and Biosecurity Association (MBBA)

Professional Memberships / Extracurricular Involvement

- Malaysian Society of Plant Physiology (MSPP) – Honorary Auditor (2017-2019); Executive Committee (2019-2021)
- Malaysian Biosafety and Biosecurity Association (MBBA), Ordinary Member, 2016-present
- Asian Federation of Biotechnology (AFOB), Ordinary Member, 2015-present
- Institutional Biosafety Committee (IBC) MARDI – Committee, 2015-present
- Malaysian Student Organization at Michigan State University – President, 2012-2013

Honors and Awards

- Bronze Medal Award – Unraveling the Genetic Code of Ceri Terengganu Fruit (MARDI Science and Technology Exhibition, 2018)
- Best Poster, 27th Malaysian Society of Plant Physiology Conference (MSPPC 2017)
- Bronze Medal Award - Delayed Ripening Eksotika Papaya via Silencing Technology (Malaysia Technology Expo, 2016)
- Silver Medal Award - Clean-Gene Technology: Moving Toward Safer Genetically Modified Crop (MARDI Science and Technology Exhibition, 2015)

References

1. Dr. Sanimah Simoh, Deputy Director, Biotechnology & Nanotechnology Research Centre (MARDI) - E-mail: sanimah@mardi.gov.my
2. Dr. Ahmad Nazarudin Mohd Roseli, President, Malaysian Society of Plant Physiology (MSPP) - E-mail: nazarudin@frim.gov.my