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EDUCATION

Ph.D., Agriculture, Sunchon National University, South Korea (awarded in 2016)

Post-graduate Diploma, Environmental Science and Disaster Management, Patuakhali Science and Technology University (awarded in 2010)

M.S., Agronomy, Bangladesh Agricultural University, Bangladesh (awarded in 2007)

B.S., Agriculture, Bangladesh Agricultural University, Bangladesh (awarded in 2005)

Postdoc
Post-doctoral training on **Climate Smart Agriculture (CSA)**, Wageningen University & Research, Netherlands (January to June, 2022)

RESEARCH INTERESTS

- Stress tolerance in crop plants
- Molecular genetics of biotic and abiotic stress resistance in plants
- System and synthetic biology of plants

SELECTED RESEARCH PUBLICATIONS

1. Khalil, M. I., Hassan, M. M., Samanta, S. C., Chowdhury, A. K., Hassan, M. Z., Ahmed, N. U., ... & **Saha, G***. (2024). Unraveling the genetic enigma of rice submergence tolerance: Shedding light on the role of ethylene response factor (ERF)-encoding gene *SUB1A-1*. ***Plant Physiology and Biochemistry,*** 108224.
2. Kaysar, M. S., Sarker, U. K., Kheya, S. A., Hasan, A. K., Hossain, M. A., Somaddar, U., ... **Saha, G** & Uddin, M. R. (2023). Root system response and yield of irrigated rice in relation to irrigation, Potassium and Nitrogen under subtropical conditions. ***Agronomy,*** 13(6), 1626.
3. Somaddar, U., Mia, S., Khalil, M.I., Sarker, U.K., Uddin, M.R., Kaysar, M.S., Chaki, A.K., Robin, A.H.K., …**Saha, G***., **2023**. Effect of Reproductive Stage-Waterlogging on the Growth and Yield of Upland Cotton (*Gossypium hirsutum*). ***Plants,*** 12(7), p.1548. (IF:4.658).
4. Kaysar, M. S., Sarker, U. K., Monira, S., Hossain, M. A., Somaddar, U., Saha, G., ... **Saha, G** & Uddin, M. R. (2023). Variations in Root Morphology and Yield among Rice Varieties in Response to Potassium under Subtropical Conditions. ***Sustainability,*** 15(11), 8589.
5. Sarker, U. K., Uddin, M. R., Hossain, M. A., Somaddar, U., & **Saha, G**. (2023). Exploring relationship among nitrogen fertilizer, yield and nitrogen use efficiency in modern wheat varieties under subtropical condition. ***Saudi Journal of Biological Sciences,*** 30(4), 103602.

6. Somaddar, U., Mim, S.K., Dey, H.C. and Biswas, A….. **Saha, G***, **2023**. Assessment of seedling salinity tolerance of Bangladeshi coastal rice landraces using morpho-physiological stress indices. ***Emirates Journal of Food and Agriculture.*** (IF:1.067)
7. Kaysar, M.S., Sarker, U.K., Monira, S., Hossain, M.A., Mokarroma, N., Somaddar, U., Saha, G., Hossain, S.F., Chaki, A.K. and Uddin, M.R., 2023. Water Stress Induced Changes in Root Traits and Yield of Irrigated Rice under Subtropical Condition. ***Water***, *15*(4), p.618.
8. Kaysar, M.S., Sarker, U.K., Monira, S., Hossain, M.A., Somaddar, U., Saha, G., Hossain, S.F., Mokarroma, N., Chaki, A.K., Bhuiya, M.S.U. and Uddin, M.R., 2022. Optimum Nitrogen Application Acclimatizes Root Morpho-Physiological Traits and Yield Potential in Rice under Subtropical Conditions. ***Life***, *12*(12), p.2051.
9. Kaysar, M.S., Sarker, U.K., Monira, S., Hossain, M.A., Haque, M.S., Somaddar, U., Saha, G., Chaki, A.K. and Uddin, M.R., 2022. Dissecting the relationship between root morphological traits and yield attributes in diverse rice cultivars under subtropical condition. ***Life***, *12*(10), p.1519.
10. Rima, S.A., Somaddar, U., Samanta, S.C. and **Saha, G***., 2022. Effect of Exogenous Salicylic Acid and Silicon Application on Salinity Tolerance of Rice. ***Bangladesh Agronomy Journal***, *25*(2), pp.119-127.
11. Saha G., Somaddar U. and Hassan Z., 2022. Role of exogenous ABA and silicon application in alleviating salinity stress in rice. ***Journal of Patuakhali Science and Technology University****,* 11(1 & 2),p..
12. Somaddar, U., Dey, H. C., Mim, S. K., Sarker, U. K., Uddin, M. R., Ahmed, N. U., ... & **Saha, G***., **2022**. Assessing Silicon-Mediated Growth Performances in Contrasting Rice Cultivars under Salt Stress. ***Plants,*** *11*(14), 1831. (IF:4.658)
13. Sultana, H., Somaddar, U., Samanta, S. C., Chowdhury, A. K., & **Saha, G***., **2022**. Diversity Analysis of Bangladeshi Coastal Rice Landraces (*Oryza sativa*) for Morpho-Physiological and Molecular Markers' Responses to Seedling Salinity Tolerance. ***Plant Breeding and Biotechnology,*** *10*(2), 115-127.
14. Robin, A.H.K., **Saha, G**., Park, J.I., Laila, R., Rahim, M.A., Bagchi, M., Kim, H.T., Jung, H.J. and Nou, I.S., **2021**. In silico analysis and expression profiling revealed Rlm1' blackleg disease-resistant genes in Chromosome 6 of *Brassica oleracea*. ***Horticulture, Environment, and Biotechnology,*** *62*(6), pp.969-983. (IF:2.138)
15. **Saha, G**., Mostofa, M.G., Rahman, M.M. and Tran, L.P., **2021**. Silicon-mediated heat tolerance in higher plants: A mechanistic outlook. ***Plant Physiology and Biochemistry*****,** 166, pp.341-347. (IF: 5.437)
16. Robin, A.H.K., **Saha, G**., Laila, R., Park, J.I., Kim, H.T. and Nou, I.S., **2020.** Expression and Role of Biosynthetic, Transporter, Receptor, and Responsive Genes for Auxin Signaling during Clubroot Disease Development. ***International Journal of Molecular Sciences*****,** *21*(15), p.5554. (IF: 6.208)
17. Laila, R., Robin, A.H.K., Park, J.I., **Saha, G**., Kim, H.T., Kayum, M. and Nou, I.S., **2020.** Expression and Role of Response Regulating, Biosynthetic and Degrading Genes for Cytokinin Signaling during Clubroot Disease Development. ***International Journal of Molecular Sciences***, 21(11), p.3896. (IF: 6.208)
18. Islam, M.F., Ahmed, N.U. and **Saha, G***., **2020.** Phenotypic and Molecular Marker Based Screening of Coastal Rice Landraces under Salt Stress. ***Plant Breeding and Biotechnology*****,** 8(3):238-251.
19. Kayum, M.A., Park, J.I., Nath, U.K., **Saha, G**., Biswas, M.K., Kim, H.T. and Nou, I.S., **2017.** Genome-wide characterization and expression profiling of PDI family gene reveals function as abiotic and

biotic stress tolerance in Chinese cabbage (*Brassica rapa* ssp. pekinensis). ***BMC genomics*****,** *18*(1), p.885. (IF: 4.558)

20. **Saha, G**., Park, J.I., Kayum, M.A. and Nou, I.S., **2016**. A genome-wide analysis reveals stress and hormone responsive patterns of TIFY family genes in *Brassica rapa.* ***Frontiers in plant science,*** 7, p.936. (IF: 6.627)
21. **Saha, G.,** Park, J. I., Ahmed, N. U., Kayum, M. A., Kang, K. K., & Nou, I. S., **2016.** Characterization and expression profiling of MYB transcription factors against stresses and during male organ development in Chinese cabbage (*Brassica rapa* ssp. pekinensis). ***Plant Physiology and Biochemistry*****,** 104: 200-215. (IF: 5.437)
22. **Saha, G.**, Park, J. I., Kim H., Kang, K. Y., Cho, Y. G. & Nou, I. S., **2016.** MADS-Box Genes Are Associated with the Petaloidy / Sepaloidy of Stamens in Cytoplasmic Male Sterile *Brassica*. ***Plant breeding and biotechnology*****,** 4 (1): 40-50.
23. Kayum, M. A., Park, J. I., Ahmed, N. U., **Saha, G**., Chung, M. Y., Kang, J. G., & Nou, I. S., **2016.** Alfin-like transcription factor family: characterization and expression profiling against stresses in *Brassica oleracea*. ***Acta Physiologiae Plantarum*****,** *38*(5), 127. (IF: 2. 736)
24. **Saha, G**., Park, J. I., Jung, H. J., Ahmed, N. U., Kayum, A., Chung, M. Y., ... & Nou, I. S., **2015.** Genome-wide identification and characterization of MADS-box family genes related to organ development and stress resistance in *Brassica rapa*. ***BMC genomics*****,** 16(1): 178. (IF: 4.558)
25. **Saha, G**., Park, J. I., Jung, H. J., Ahmed, N. U., Kayum, M. A., Kang, J. G., & Nou, I. S., **2015.** Molecular characterization of BZR transcription factor family and abiotic stress induced expression profiling in *Brassica rapa*. ***Plant Physiology and Biochemistry*****,** *92:* 92-104. (IF: 5.437)
26. Kayum, M. A., Park, J. I., Ahmed, N. U., Jung, H. J., **Saha, G**., Kang, J. G., & Nou, I. S., **2015.** Characterization and stress-induced expression analysis of Alfin-like transcription factors in *Brassica rapa*. ***Molecular Genetics and Genomics*****,** 1-13. (IF: 2.980)
27. Kayum, M. A., Jung, H. J., Park, J. I., Ahmed, N. U., **Saha, G**., Yang, T. J., & Nou, I. S., **2014.** Identification and expression analysis of WRKY family genes under biotic and abiotic stresses in *Brassica rapa*. ***Molecular Genetics and Genomics*****,** *290*(1), 79-95. (IF: 2.980)

(*** as corresponding author**)

TEACHING EXPERIENCES

- **Professor,** Department of Agronomy, Patuakhali Science and Technology University; 2020 to Present
- **Associate Professor,** Department of Agronomy, Patuakhali Science and Technology University; 2016 to 2020
- **Assistant Professor,** Department of Agronomy, Patuakhali Science and Technology University; 2011 to 2016
- **Lecturer,** Department of Agronomy, Patuakhali Science and Technology University; 2009 to 2011.

RESEARCH SKILLS

Molecular biological skills

- DNA, and RNA-isolation
- PCR including RT-qPCR
- Gene cloning and sequencing
- Protein sub-cellular localizaion

- Gel electrophoresis
- RNA-seqencing
- Plant tissue culture
- Cell imaging

Analytical chemistry skills

- ROS determination
- Ion accumulation
- Chlorophyll content determination
- Enzymatic assay
- Plant digestion and distillation
- Colorimetry
- Proline assay
- Hormonal and nutrient homeostasis

Software skills

- Statistical analysis: R, SAS, JMP, Minitab, Sigmaplot
- Sequence analysis: BLAST, SMART, ORF finder, Map Chart, GSDS, MCScanX, MAFFT, CLC sequence viewer
- Sequence alignment: CLUSTALW
- Promoter analysis: PlantCARE
- Primer design: Primer3
- Phylogenetics: MEGAX
- Microsynteny: Circos
- Gene ontology: AEGIS, ShinyGO, GOnet
- Expression heat map: Cluster 3.0
- Alpha Fold 2 on Google Colab's Notebook
- Protein interaction: STRING
- Protein properties: ExPasy, Softberry, MEME, Plant-mSubP, BUSCA, DeepLoc-1.0
- KEGG Blast KOALA for gene/protein pathway

SELECTED RESEARCH FUNDINGS (*as PI and Co-PI for the following research projects-)*

- Evaluation of coastal rice landraces under salinity using agro-morphological and biochemical indices (as PI) 2019
- Role of exogenous ABA and silicon application in alleviating salinity stress in rice (as PI) 2019
- Silicon-mediated changes in growth performances, ion toxicity, chlorophyll contents and proline accumulation in contrasting rice genotypes under salt stress (as PI) 2020
- Development of biochar enriched fertilizer for enhancing nutrient use efficiency in agriculture (as Co-PI & PI) 2021-2024
- Exploration of new sources of tolerance to submergence of coastal rice landraces through phenotyping and DNA fingerprinting (as PI) 2021-2024
- Expression analysis of ethylene response factor genes associated with submergence tolerance of coastal rice landraces (as PI) 2021-2022
- Assessing silicon-mediated growth performances in cotton (as PI) (2021-24)
- Investigating silicon- and silicon-nanoparticles -mediated submergence tolerance in rice (*Oryza sativa*) (as PI) (2023-24)

SELECTED CONFERENCE PRESENTATIONS

Saha G. Use of silicon-based fertilizers in crop production: a way forward to agricultural sustainability. International Conference on "Climate Smart Agriculture for a Resilient Coastal Bangladesh"- organized by Patuakhali Science and Technology University and Wageningen University & Research, February 15-16, 2023.

Saha G., Park J.I., Ahmed N.U., Kayum M.A. and Nou I.S. TIFY family genes in Chinese cabbage (*Brassica rapa* ssp. pekinensis): A Genome-wide analysis reveals their stress and hormone responsive patterns. Bexco Symposium (Fusion Technologies in Plant Breeding and Globalization of Seed Industry. The Korean Society of Breeding Science. July 1-3, 2015. Oral

Kayum M.A, Park J.I., Ahmed N.U., **Saha G.** and Nou I.S. Characterization of the aquaporin family genes and stress responsive expression profiling in *Brassica rapa*. Bexco Symposium (Fusion Technologies in Plant Breeding and Globalization of Seed Industry. The Korean Society of Breeding Science. July 1-3, 2015. Poster

Saha G., Park J.I., Jung H.J., Ahmed N.U., Kayum M.A. and Nou I.S. MYB Transcription Factor Family: Characterization and Expression Profiling against Stresses in *Brassica rapa.* Korean Horticultural Society Meeting. October 2014, South Korea. Poster

Kayum M.A., Park J.I., Ahmed N.U., **Saha G.** and Nou I.S. Aquaporin Gene Family: Characterization and Stressinduced Expression Analysis in *Brassica rapa.* Korean Horticultural Society Academic Presentation. August 2014. Jeonju, South Korea. Poster

Saha G., Park J.I., Jung H.J., Ahmed N.U. and Nou I.S. Genome-wide Identification, Organization and Expression Profiling MADS-box Gene Family in *Brassica rapa* against stresses and during organ development. Plant & Animal Genome (PAG XXII) Conference, January 11-14 2014. San Diego, USA. Abstract

STUDENT ADVISORY AND PROFESSIONAL ENGAGEMENT

- Supervising MS and PhD students' research, Department of Agronomy, Patuakhali Science and Technology University (PSTU), Bangladesh
- Currently engaged as **'Guest Editor'** in a special issue publication (Plant Physiological, Biochemical, and Molecular Responses to Abiotic Stresses; Vol. 1 & 2) for the journal 'Plants' (IF: 4.658; a Q1 journal in the 'Plant Sciences' category)
- Performing as **'Managing Editor'** for the 'Journal of the Patuakhali Science and Technology University (JPSTU)'.

- **Serving as peer reviewer for the following journal-**
  - Scientific Reports (Nature Research),
  - Plant Physiology and Biochemistry (Elsevier),
  - Molecular Genetics Genomics (Springer),
  - Environmental and Experimental Botany **(**Elsevier),
  - Frontiers in plant science/Genetics
  - PLoS ONE
  - AoB Plants (Oxford University Press)
  - Plant Breeding and Biotechnology (Korean Society of Breeding Science)

LANGUAGE PROFICIENCY

- Bengali (as mother tongue), English (Competent user in speaking, reading and writing)

REFERENCES

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Institute of Genomics for Crop Abiotic Stress Tolerance, Texas Tech University, Lubbock, Texas, USA
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