CURRICULUM VITAE OF DR. MD NUREALAM SIDDIQUI

Dr. Md. Nurealam Siddiqui
Associate Professor & Head
Department of Biochemistry and Molecular Biology
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DATE OF BIRTH AND NATIONALITY

28 December 1987 and Bangladeshi by birth

AREA OF RESEARCH SPECIALIZATION

- Plant biochemistry and stress physiology
- Quantitative genetics, genomics and molecular breeding
- Molecular plant nutrition
- High-throughput phenotyping
- Functional characterization of genes in crop plants.

RESEARCH/EMPLOYMENT HISTORY

(Nov. 2022 to till now)	**Head,** Dept. of Biochemistry and Molecular Biology, Bangabandhu Sheikh Mujibur Rahman Agricultural University, Bangladesh
(Feb. 2022 to till now)	**Associate Professor**, Dept. of Biochemistry and Molecular Biology, Bangabandhu Sheikh Mujibur Rahman Agricultural University, Bangladesh
(Feb. 2015 to Feb 2022)	**Assistant Professor**, Dept. of Biochemistry and Molecular Biology, Bangabandhu Sheikh Mujibur Rahman Agricultural University, Bangladesh
(Feb. 2013 to Feb. 2015)	**Lecturer**, Dept. of Biochemistry and Molecular Biology, Bangabandhu Sheikh Mujibur Rahman Agricultural University, Bangladesh
(Sep. 2012 to Feb. 2013)	**Lecturer**, Dept. of Basic Sciences, Sheikh Fajilatunnessa Mujib Fisheries College affiliated to Bangladesh Agricultural University.
(Jan. 2010 to Sep. 2011)	**Research Assistant,** Dept. of Biochemistry and Molecular Biology, Hajee Mohammad Danesh Science and Technology University

EDUCATION

(Oct. 2018 to Oct. 2022)	**Doctor of Philosophy (Ph.D.) in Agricultural Sciences** Faculty of Agriculture, University of Bonn, Germany
(Oct. 2010 to April 2012)	**Master of Science (MS) in Biochemistry and Molecular Biology** Hajee Mohammad Danesh Science and Technology University, Bangladesh

(Jan. 2006 to Dec. 2009)	**Bachelor of Science (BS) in Agriculture** Hajee Mohammad Danesh Science and Technology University, Bangladesh.
(Jan. 2003 to Dec. 2005)	**Higher Secondary Certificate (HSC) in Science** Rajshahi board, Bangladesh
(Jan. 1998 to De. 2003)	**Secondary School Certificate (SSC) in Science** Rajshahi board, Bangladesh

FELLOWSHIPS/AWARDS

- **New Phytologist Next Generation Scientists in 2023** awarded by the New Phytologist Foundation and National University of Singapore.
- **BSMRAU-TA Research Award 2021** for outstanding research accomplishment by the Bangbandhu Sheikh Mujibur Rahman Agricultural University Teachers Association (BSMRAUTA).
- **DAAD outstanding involvement award 2021** among international students studying at German Universities.
- **German Academic Exchange Service (DAAD) Fellowship** (June 2018 - Sep. 2022), PhD candidate, INRES-Plant Breeding, University of Bonn, Germany
- **NSICT Fellowship** (Oct. 2011 - April 2012) by Ministry of National, Science and Information and Technology, People's Republic of Bangladesh
- **Visiting Fellow** (16 Oct. - 29 Oct. 2011) "Invitation Program for Science and Technological Human Resources under the Japan- East Asia Network of Exchange for Students and Youths (JENESYS)" by Japan International Cooperation Centre.
- **Merit Scholarship** (2008-2010) by HOPES (Helping Organization for Promising and Energetic Students), Paragon House, 5 Mohakhali C/A, Dhaka, Bangladesh
- **Dean Award** (2010) at undergraduate level for outstanding academic achievements by Faculty of Agriculture, Hajee Mohammad Danesh Science and Technology University, Bangladesh
- **University Merit Scholarship** at undergraduate level, Hajee Mohammad Danesh Science and Technology University, Bangladesh (2006-2009).

CURRENT RESEARCH FOCUS

- Nutrient-dependent dynamics of root system architecture in cereal crops
- Genetic and genomic basis of abiotic and nutrient stress tolerance.
- Phenotyping of agronomic traits to understand genetic basis of drought adaptation
- Plant responses to abiotic stresses using genetic, genomics and phenotypic tools.

RESEARCH EXPERTISE

Analytical works: Quantitative genetics, Genome-wide association study (GWAS) using rrBLUP, GAPIT and TASSEL, QTL mapping, molecular marker (SNP) data processing and analysis, phenotypic data analysis and visualization (ANOVA, PCA and correlogram) in R studio, primer

designing, identification of candidate genes and syntenic regions, functional annotation of genes, analysis of *cis*-acting regulatory elements, promoter analysis, prediction of protein-protein interaction using STRING, and cystoscope.

Molecular/Lab works: DNA and RNA extraction and quantification, gradient PCR, purification of PCR products, gene sequencing, qRT-PCR, enzymatic analysis, determination of nutrient translocation in root and shoot, and nutrient content analysis.

Phenotyping works: Root-shoot phenotyping under field, greenhouse and rhizotron experiments, Nutrient analysis, Shovelomics for filed-based root phenotyping, Root scanning, WinRHIZO analysis, Digital microscopy and image analysis, Photosynthesis measurements using SPAD, MINI-PAM, LICOR, FluroPen, and PolyPen.

Bioinformatic tools: NCBI database, protein sequence analysis, protein domain analysis, phylogenetic analysis, and genomic sequence alignment (pairwise and multiple).

PUBLICATIONS

Important Articles in different Peer-Reviewed Journals

Total citations: **1716**, h-index: 22, i10-index: 30 (as of November 06, 2023, Google Scholar). For current citation metrics please visit:

https://scholar.google.com/citations?user=BSslWlkAAAAJ&hl=en

1. **Siddiqui, M.N.,** Pandey, K., Bhadhury, S.K., Sadeqi, B., Schneider, M., Stich, B., Léon, J., & Ballvora, A. (2023). Convergently selected NPF2.12 coordinates root growth and nitrogen use efficiency in wheat and barley. ***New Phytologist,*** 238: 2175-2193.

2. **Siddiqui, M.N.,** Melesech, T. G., Abebaw, A.M., Tesfaye, J.T., Dadshani, S., Léon, J., & Ballvora, A. (2023). Genetic dissection of candidate genes underlying root phenotypic plasticity for adaptation to drought in bread wheat. ***BMC Genomic Data*** 24(1), 1-16.

3. Kamruzzaman M, **Siddiqui, M.N.** Ballvora, A., Léon, J., Naz, A.A. (2002). Hydrogen peroxide-induced genetic diversity of bread wheat and mapping of candidate loci by genome-wide association study. ***Plant Direct*** (Under major revision).

4. Koua, A.P., **Siddiqui, M.N.,** Heß, K., Klag, N., Duarte-Delgado, D., Oyiga, B.C., Léon, J., & Ballvora, A. (2023). Genome-wide dissection and haplotype analysis identified candidate loci for nitrogen use efficiency under drought conditions in winter wheat. ***The Plant Genome***. doi: 10.1002/tpg2.20394.

5. Kamruzzaman, M., Shrestha, A., **Siddiqui, M.N.,** Oyiga, B.C., Ballvora, A., Léon, J., Naz, A.A. (2022). Genetic mapping of candidate loci for water-deficit stress-induced proline accumulation in bread wheat (*Triticum aestivum*). ***Plant Breeding***. doi: 10.1111/pbr.13096.

6. **Siddiqui, M.N.,** Schneider, M., Barbosa, M., Léon, J., & Ballvora, A. (2022). Natural selection under conventional and organic cropping systems affect root architecture in spring barley. ***Scientific Reports***, 12, 20095.

7. Kamruzzaman, M., Beyene, M.A., **Siddiqui, M.N.,** Ballvora, A., Léon, J., Naz, A.A. (2022). Pinpointing genomic loci for drought-induced proline and hydrogen peroxide accumulation in bread wheat under field conditions. ***BMC Plant Biology***, 22, 584.

8. Mohamed, M., **Siddiqui, M. N.,** Oyiga, B. C., Léon, J., & Ballvora, A. (2022). Validation of a QTL on chromosome 1ds showing a major effect on salt tolerance in winter wheat. ***International Journal of Molecular Sciences***, *23*(22), 13745.

9. Doumbia, I. Z., **Siddiqui, M. N.,** Diallo, M., Dembélé, S., Dolo, A., & Mulaudzi, T. (2022). Performance of Malian cowpea (*Vigna unguiculata* (L.) Walp) genotypes to drought stress under field conditions. ***Journal of Agricultural and Crop Research***, *10*(8), 154-166.

10. **Siddiqui, M.N.,** Tesfaye, J.T., Abebaw, A.M., Melesech, T. G., Koua, P., Léon, J., & Ballvora, A. (2021). New drought-adaptive loci underlying candidate genes on wheat chromosome 4B with improved photosynthesis and yield responses. ***Physiologia Plantarum,*** 173 (4): 2166-2180.

11. **Siddiqui, M. N.,** Léon, J., Naz, A. A., & Ballvora, A. (2021). Genetics and genomics of root system variation in adaptation to drought stress in cereal crops. ***Journal of Experimental Botany***, *72*(4), 1007-1019.

12. Akter, M., Mahmud, A., Akter, M., **Siddiqui, M. N*,** & Khan, M. A. R. (2021). Dissecting the salt tolerance potential of cowpea genotypes based on morpho-physiology and yield-related attributes. ***Annals of Applied Biology,*** 180: 428-437.

13. Rahman, M., Mostofa, M. G., Keya, S. S., **Siddiqui, M.,** Ansary, M., Uddin, M., & Tran, L. S. P. (2021). Adaptive Mechanisms of Halophytes and Their Potential in Improving Salinity Tolerance in Plants. ***International Journal of Molecular Sciences***, *22*(19), 10733.

14. Ghosh, U. K., Islam, M. N., **Siddiqui, M. N.,** Cao, X., & Khan, M. A. R. (2021). Proline, a multifaceted signalling molecule in plant responses to abiotic stress: understanding the physiological mechanisms. ***Plant Biology***, 24 (2): 227-239.

15. Ghosh, U.K., Islam, M.N., **Siddiqui, M.N.,** Khan, A.R. (2021). Understanding the roles of osmolytes for acclimatizing plants to changing environment: A review of potential mechanism. ***Plant Signaling & Behavior,*** 16 (8): 1913306.

16. **Siddiqui, M. N.,** Mostofa, M. G., Rahman, M. M., Tahjib-Ul-Arif, M., Das, A. K., Mohi-Ud-Din, M., & Tran, L. S. P. (2021). Glutathione improves rice tolerance to submergence: insights into its physiological and biochemical mechanisms. ***Journal of Biotechnology***, *325*, 109-118.

17. Rana, R. A., **Siddiqui, M.N.,** Skalicky, M., Brestic, M., Hossain, A., Kayesh, E., ... & Islam, T. (2021). Prospects of nanotechnology in improving the productivity and quality of horticultural crops. ***Horticulturae***, *7*(10), 332.

18. Mohi-Ud-Din, M., **Siddiqui, M. N.,** Rohman, M., Jagadish, S. K., Ahmed, J. U., Hassan, M. M., ... & Islam, T. (2021). Physiological and biochemical dissection reveals a trade-off between

antioxidant capacity and heat tolerance in bread wheat (*Triticum aestivum* L.). ***Antioxidants***, *10*(3), 351.

19. Mostofa, M. G., Rahman, M. M., **Siddiqui, M. N.,** Fujita, M., & Tran, L. S. P. (2020). Salicylic acid antagonizes selenium phytotoxicity in rice: selenium homeostasis, oxidative stress metabolism and methylglyoxal detoxification. ***Journal of Hazardous Materials***, *394*, 122572.

20. Tahjib-Ul-Arif, M., **Siddiqui, M. N.,** Sohag, A. A. M., Sakil, M. A., Rahman, M. M., Polash, M. A. S., & Tran, L. S. P. (2018). Salicylic acid-mediated enhancement of photosynthesis attributes and antioxidant capacity contributes to yield improvement of maize plants under salt stress. ***Journal of Plant Growth Regulation***, *37*(4), 1318-1330.

21. Tahjib-Ul-Arif, M., Sayed, M. A., Islam, M. M., **Siddiqui, M. N.,** Begum, S. N., & Hossain, M. A. (2018). Screening of rice landraces (*Oryza sativa* L.) for seedling stage salinity tolerance using morpho-physiological and molecular markers. ***Acta Physiologiae Plantarum***, *40*(4), 1-12.

22. **Siddiqui, M. N.,** Mostofa, M. G., Akter, M. M., Srivastava, A. K., Sayed, M. A., Hasan, M. S., & Tran, L. S. P. (2017). Impact of salt-induced toxicity on growth and yield-potential of local wheat cultivars: oxidative stress and ion toxicity are among the major determinants of salt-tolerant capacity. ***Chemosphere***, *187*, 385-394.

23. Mostofa, M. G., Hossain, M. A., **Siddiqui, M. N.,** Fujita, M., & Tran, L. S. P. (2017). Phenotypical, physiological and biochemical analyses provide insight into selenium-induced phytotoxicity in rice plants. ***Chemosphere***, *178*, 212-223.

24. Akram, S., **Siddiqui, M. N.,** Hussain, B. N., Al Bari, M. A., Mostofa, M. G., Hossain, M. A., & Tran, L. S. P. (2017). Exogenous glutathione modulates salinity tolerance of soybean [*Glycine max* (L.) Merrill] at reproductive stage. ***Journal of Plant Growth Regulation***, *36*(4), 877-888.

25. Sayed, M. A., Imam, R., **Siddiqui, M. N.,** Raihanun-Nabi, S. M., Aktar, S., & Das, S. R. (2016). Allelopathic activity of *Leonurus siribicus* L. on seed germination and seedling growth of wheat and identification of 4-hydroxy benzoic acid as an allelochemical by chromatography. ***Pak. J. Bot***, *48*(3), 1189-1195.

26. Hasan, A., Hafiz, H. R., **Siddiqui, N.,** Khatun, M., Islam, R., & Mamun, A. A. (2015). Evaluation of wheat genotypes for salt tolerance based on some physiological traits. ***Journal of Crop Science and Biotechnology***, *18*(5), 333-340.

27. Roy, T. K., Hafiz, M. H. R., Islam, M. R., Hasan, M. A., & **Siddiqui, M. N.** (2013). Late planting heat stress on ear growth physiology of wheat. ***International Journal of Biosciences***, *3*(11), 8-19.

MANUSCRIPT READY TO SUBMIT

- **Siddiqui, M.N.,** Léon, J., & Ballvora, A. (2023). Comparative genome-wide scan reveals root architectural and anatomical adaptation towards drought in wheat and barley.
- **Siddiqui, M.N.**, Jahiu, M., Kamruzzaman, M., Leon, J., Ballvora, A. (2023). Genomic insight into the pleiotropic effects of root architecture traits under drought stress in spring barley.

CONFERENCE TALK

- **Siddiqui, M.N.,** Léon, J., & Ballvora, A. (2022). A nitrate transceptor homolog NPF2.12 coordinates root growth and nitrogen use efficiency in wheat and barley. New phytologist next generation scientists meeting, National University of Singapore, 2-5 July 2023.
- **Siddiqui, M.N.,** Léon, J., & Ballvora, A. (2022). A syntenic loci underpin nitrate transport and root system architecture in wheat and barley. German Plant Breeding Society (GPZ) main conference on September 12-14, 2022 in Düsseldorf, Germany.
- **Siddiqui, M.N.,** Léon, J., & Ballvora, A. (2022). Nitrate-dependent dynamics of root system architecture: Uncovering its molecular regulators in winter wheat. 3rd international conference on "Climate Smart Agriculture: The Way towards Ecosystem Restoration" March 15-16, 2022 organized by University of Agriculture Multan, Punjab, Pakistan.
- **Siddiqui, M.N.,** Léon, J., & Ballvora, A. (2022). A syntenic loci tunes nitrate transport by regulating root system architecture between wheat and barley. International Conference on Sustainable Agriculture through Nuclear and Frontier Research, January 19-21, 2022 in Bangladesh Institute of Nuclear Agriculture (BINA), Bangladesh.
- **Siddiqui, M.N.,** Léon, J., & Ballvora, A. (2021). Natural variation in the promoter of *NPF2.12* is associated with nitrate-use efficiency and grain yield in wheat by tailoring root growth and development. 11th Symposium of the International Society of Root Research, May 24-28, 2021. University of Missouri, USA.

COMPLETED RESEARCH PROJECTS

- "Breeding Innovations in Wheat for Resilient Cropping Systems" (BRIWECS) funded by the German Federal Ministry of Education and Research (BMBF), PTJ for the year 2018-2022 (served as Research Assistant).
- "Nutrient Use Efficiency in Wheat" funded by the German Federal Office for Agriculture and Food Project "POeWER" FKZ: 2818105815 for the Year 2018-2022 (served as Research Assistant).
- "Physiological Responses of Exogenous Glutathione in Mitigating Submergence Damage in Rice" funded by the University Grants Commission (UGC) of Bangladesh for the year 2016-2017 (served as Principal Investigator).
- "Salt tolerant Mechanism and Involvement of *AOX* Gene in Wheat Cultivars in Bangladesh" funded by RMC (BSMRAU-UGC), Bangladesh for the year 2014-2015 (served as Principal Investigator).

- "Studies on Seed Extract of Buckwheat in Broiler Diets for Decreasing Serum Lipid Profile and Harmful Intestinal Microflora" funded by Ministry of Science & Technology, People's Republic of Bangladesh from November 2013 to May 2014 (served as Co-Investigator).
- "Sustainable Food Production by the Application of Natural Resources" funded by Ministry of Science & Technology, People's Republic of Bangladesh from November 2010 to February 2012 (served as Research Assistant).

PROFESSIONAL MEMBERSHIP

- **Member** of the German Society for Plant Sciences (DBG)
- **Member** of International Society of Root Research (ISRR)
- **Member** of the Journal Club of Plant Breeding Group, University of Bonn, Germany
- **Member** (GM759) of Global Network for Bangladeshi Biotechnologists (GNOBB), Dhaka, Bangladesh
- **Member** of Asian Council of Science Editors (ACSE), Dubai U.A.E
- **Member** of the Society for Redox Biology and Medicine (SfRBM), Indiana, USA
- **Life member** of Bangladesh Association for the Advancement of Science (BAAS), Dhaka, Bangladesh
- **Life Member** Alumni Association of German Universities in Bangladesh
- **Life member** of Ecological Society of Bangladesh, BSMRAU, Gazipur, Bangladesh
- **Life Member** of the Krishibid (Agriculturist) Institution, Dhaka, Bangladesh.

ADMINISTRATIVE, ACADEMIC AND OTHER POSITION

- **Head**, Department of Biochemistry and Molecular Biology, BSMRAU, Bangladesh from November 2022 to till date.
- **Chairman**, Board of Studies (BOS), Department of Biochemistry and Molecular Biology, BSMRAU, Bangladesh from November 2022 to till date.
- **Member**, Academic Council, BSMRAU, Bangladesh from October 2022 to till date.
- **Member,** Planning & Development Committee, Bangabandhu Sheikh Mujibur Rahman Agricultural University.
- **Office Secretary**, Bangabandhu Sheikh Mujibur Rahman Agricultural University Teacher's Association (BSMRAU-TA), Executive Committee 2023.
- **Publication Secretary**, Ecological Society of Bangladesh, Executive Committee 2023-2024.

JOURNAL EDITOR AND REVIEWING EXPERIENCE

- **Guest Editor** in **"**Agriculture" (Impact Factor 3.408) for a Special Issue (2023): Plant Stress Tolerance: Physiological, Molecular and Genetic Perspectives (https://www.mdpi.com/journal/agriculture/special_issues/412P9JX1JR).
- **Section Editor** (genetics and development): *Plant Science today*

Manuscript reviewed for following international peer-reviewed journals:

- Protoplasma
- Functional Plant Biology
- Plant Breeding
- PLOS ONE
- Plant Methods
- Plant Directs
- Plant Physiology and Biochemistry

TEACHING AND MENTORING

- Courses taught at undergraduate level: Chemistry of Biomolecules, Metabolisms of Biomolecules, Biophysics and Chemistry of Biomolecules and Molecular Biology
- Courses taught at graduate level: Plant physiology, Plant Biochemistry, and Plant Molecular Biology
- Supervised 07 students during their Master thesis works under Agricultural Sciences and Resource Management in Tropics and Subtropics (ARTS) and Master of Science in Plant Science programs in Universität Bonn, Germany
- Supervised and mentored 04 Internship students from Erasmus Mundus Master Program in Plant Breeding in France and master's in plant science of University of Bonn.
- One master student has been awarded as "**Best Thesis**" in 2020 among different European Universities under Erasmus Mundus Master Program in Plant Breeding in France.

List of Master's supervised students

Student name	Thesis Title	Year
Marissa B. Barbosa	Root morphological characterization and haplotype allele frequency estimation in barley (*Hordeum vulgare* L.) evolved from long-term selection trial under conventional and organic cropping systems	2020
Melesech Teshale Gabi	Genome-wide association study of root architectural traits adaptive to drought stress in winter wheat	2020
Tesfaye Jorgi Teferi	Genetic dissection of shoot physiological variability and identification of drought-responsive loci in bread wheat	2020
Abebaw Misganaw Ambaw	Genome-wide association study of root anatomical phenes in adaptation to drought stress in bread wheat	2020
Mst. Mahmuda Akter	Uncovering drought-induced natural genetic diversity, heritability, and genetic advance of physiological traits in the barley (*Hordeum vulgare* L.) genepool	2021
Walid Ben Yahia	Identification of drought adaptive traits in diverse spring barley (*Hordeum vulgare* L.) germplasms	2022
Melisa Jahiu	Genome-wide natural variation affects root architectural adaptation to drought stress in spring barley	2022

INTERNATIONAL MEDIA NEWS

- How plants adapt to nitrogen deficiency, 30 March 2023, *University of Bonn Press*, Germany, https://www.uni-bonn.de/en/news/045-2023

- Genetic variants help plants adapt to nitrogen deficiency, 04 April 2023, earth.com, https://www.earth.com/news/genetic-variants-help-plants-adapt-to-nitrogen-deficiency/

- How plants adapt to nitrogen deficiency, 30 March 2023, *Environmental News Network (ENN)*, USA, https://www.enn.com/articles/72267-how-plants-adapt-to-nitrogen-deficiency

- Researchers discover gene variants in wheat and barley that improve nitrogen utilization, 30 March 2023, *Phys.Org*, https://phys.org/news/2023-03-gene-variants-wheat-barley-nitrogen.html

- How plants adapt to nitrogen deficiency, 30 March 2023, *Informationsdienst Wissenschaft* (idw), Germany, https://idw-online.de/en/news811818

- How plants adapt to nitrogen deficiency, 30 March 2023, *EurekAlert, American Association for the Advancement of Science (AAAS)*, USA, https://www.eurekalert.org/news-releases/984540

LANGUAGE SKILLS

Bengali	Native
English	Fluent in speaking and writing
German	Competence level A2
Arabic	Good in reading and writing

REFERENCES

1. **Professor Dr. Jens Léon (PhD Supervisor)**
   INRES-Plant Breeding, University of Bonn
   D-53115, Bonn
   Head of Charge, Field Lab Campus Klein-Altendorf, University of Bonn
   Klein-Altendorf 2, 53359 Rheinbach, Germany
   Email: j.leon@uni-bonn.de

2. **Dr. Agim Ballvora (PhD Mentor)**
   INRES-Plant Breeding, University of Bonn
   D-53115, Bonn, Germany
   Email: ballvora@uni-bonn.de

3. **Professor Dr. Tofazzal Islam (Master's Supervisor)**
   Founding Director, Institute of Biotechnology and Genetic Engineering
   Bangabandhu Sheikh Mujibur Rahman Agricultural University
   Gazipur 1706, Bangladesh
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