

# Md. Mahmudul Hasan, PhD

**The Norman E. Borlaug Research Fellow**, Division of Plant Sciences, College of Agriculture, Food and Natural Resources, University of Missouri, Columbia, MO 65211, United States, February 2020-May 2020

**PhD (Plant Nutrition): 2015: China Agricultural University, Beijing, China**



**MSc (Agricultural Botany): 2009: PSTU, Bangladesh**

**BSc (Agriculture): 2006: PSTU, Bangladesh**

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## PERSONAL STATEMENT

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**Assistant Professor**, Department of Nutrition and Food Technology, Jashore University of Science and Technology, Jashore-7408, Bangladesh. January 2018-Till date

Research Focus: Engineering transporter for increased accumulation of plant nutrients (mostly essential amino acids).

**Editor in Chief**, Malaysian Journal of Halal Research  
(<https://www.myjhalalresearch.com/>)

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## EDUCATION

**The Norman E. Borlaug Research Fellow**, Division of Plant Sciences, College of Agriculture, Food and Natural Resources, University of Missouri, Columbia, MO 65211, USA

*Major contribution:* Crispr Cas9 mediated transporter editing in soybean.

**PhD (Plant Nutrition)**

**2010-2015, China Agricultural University (CAU), Beijing, China**

*Dissertation:* Cloning and functional characterization of monosaccharide and amino acid transporters in maize

*Course work:* 3.52 (out of 4.00)

*Specialization:* Molecular biology of essential amino acids, and sugars in maize

*Major contribution:* Since human lacks essential amino acids, my major research was focused on how to increase essential amino acid content in major grain crops by genetic engineering. Since amino acid uptake and transport is governed by amino acid

transporters, I have cloned two putative ear expressed maize amino acid transporters for their functional characterization. According to phylogenetic analysis, these two transporters were named as *ZmVAAT3* and *ZmAAP4*. Functional complementation in yeast system revealed that these two amino acid transporters are broad spectrum transporters and transport multiple amino acids. Subcellular localization revealed plasmamembrane and nuclear localization proteins. Then, overexpression these two transporters into arabidopsis resulted enhanced growth and higher accumulation of essential amino acids. Since, rhizospheric sugar reuptake and transport plays a vital role to increase photosynthetic efficiency and sugar content in plant, I have cloned maize sugar transporter *ZmSTP1* for its functional characterization and overexpression in arabidopsis. Functional complementation in yeast mutant resulted that *ZmSTP1* transports multiple monosaccharides with high affinity. GFP tagged sub cellular localization revealed that *ZmSTP1* is plasmamembrane and nuclear localized protein. Tissue specific expression by *in situ* hybridization revealed that *ZmSTP1* is expressed in epidermis, cortex and vascular cell of primary and secondary root tips. Overexpression of *ZmSTP1* into arabidopsis revealed higher uptake, accumulation of table and stored sugars. Not surprisingly, *ZmSTP1* overexpression increased seed yield, dry weight, and sugar content at harvest.

**M.Sc. (Agricultural Botany)**

**2007-2008, Patuakhali Science and Technology University (PSTU), Bangladesh**

*Thesis:* Selection of heat tolerant wheat genotypes under short winter condition of patuakhali district

CGPA: 3.97 (out of 4.00); Thesis Grade: Excellent

Supervisors: Prof. Md. Zohurul Haque, Dr. Nazmun Naher

*Specialization:* Plant Stress Physiology

*Major contribution:* Since short winter, and heat stress are major limiting factors in yield and quality of wheat in Bangladesh, my major research was focused on selection of heat tolerant wheat genotypes. Fifteen wheat genotypes were sown under optimum (November'30) and late (December'30) sowing times to evaluate their performances at high temperature depending on cell membrane thermostability (CMT) and some morpho-physiological characters. Based on cell membrane thermostability (CMT) and other morpho-physiological characteristics four genotypes (Agrani, CB 30, Kanchan and CB 69) showed the longest heat killing time highest yield and yield attributes and considered as heat tolerant genotypes.

**B.Sc. (Agriculture)**

**1999-2003 (Degree conferred in 2006), Patuakhali Science and Technology University (PSTU), Bangladesh**

CGPA: 3.68 (out of 4.00)

*Major Courses:* Plant Biotechnology, Genetics and Plant Breeding, Agronomy,

Horticulture, Biology (Botany/Zoology), Soil Science, Statistics, Agricultural Economics, Animal Husbandry, Farm Mechanics, Entomology, Plant Pathology, Rural Sociology, Agricultural Extension, Chemistry (Physical & analytical, Organic, and Biochemistry).

**Notes:** 12-year pre-university education in Bangladesh 1987-1999, Higher Secondary Certificate, and Secondary School Certificate held nationwide

**First class** in both HSC and SSC education

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## **SKILLS AND TECHNIQUES**

- Recombinant DNA technology
  - *Agrobacterium* and particle bombardment mediated genetic transformation into plant cell
  - Isolation of RNA and analysis by transcriptional profiling
  - *In-situ* hybridization
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## **EMPLOYMENT HISTORY**

### **Assistant Professor**

**January 2018-till date**

Department of Nutrition and Food Technology  
Jashore University of Science and Technology  
Jashore-7408, Bangladesh

### **Deputy Director**

**February, 2019-Till date**

Dr. M A Wazed Miah Institute of Advance Studies  
Jashore University of Science and Technology  
Jashore-7408, Bangladesh

### **Assistant Professor**

**September 2016-December 2017**

Nutrition and Food Engineering  
Daffodil International University  
Dhaka, Bangladesh

### **Senior Executive** (Research and Development)

**October 2015-August 2016**

Apex Biotechnology Lab  
Gulshan, Dhaka, Bangladesh

### **Research Associate**

**September 2010-July 2015**

**China Agricultural University (CAU), Beijing, China**

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## **CONFERENCES, WORKSHOPS**

### **International Conference on Clean Water, Air and Soil**

Bali, Indonesia (August 10-12, 2018)

### **International (56<sup>th</sup> annual) maize genetic conference**

Beijing International Conference Center, Beijing, China (March 13- 16, 2014)

## **Workshop on Molecular Plant Nutrition**

China Agricultural University Conference Center, Beijing, China (December 30-31, 2014)

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## **RESEARCH GRANT, SCHOLARSHIPS, AND FELLOWSHIPS**

**The Norman E. Borlaug Fellowship-2019**, Division of Plant Sciences, College of Agriculture, Food and Natural Resources, University of Missouri, Columbia, MO 65211, United States. Grant Amount 50,000 USD.

**Research Grant from the Ministry of Education**, Bangladesh in 2018-19 financial year with a worth of ~20,000 USD.

**Grant from ICT Division Bangladesh** in 2019-20 Financial Year ~23000USD

**Research Grant from ICT Division Bangladesh** in 2020-21 Financial Year ~18000USD

**Research Grant from Jashore University of Science and Technology**, Bangladesh in 2018-19 financial year with a worth of ~5000USD.

**Chinese Government PhD Scholarship** (September 2010-July 2015): Awarded scholarship for PhD education at CAU, China

**Serbian Government PhD Scholarship** (September 2010-July 2014): Nominated

**NSICT Fellowship** (January 2008-November 2008): National Science and Information and Communication Technology (NSICT) Fellowship, Government of Bangladesh in favor of M.Sc research.

**Merit Scholarship** (1999-2003): Award for academic excellence, four consecutive years of undergraduate study at Patuakhali Science and Technology University (PSTU), Bangladesh.

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## **PROFESSIONAL INVOLVEMENT**

**Editor in Chief, Malaysian Journal of Halal Research**

(<https://www.myjhalalresearch.com/>)

**Editorial Board Member, Innovations in Molecular Biotechnology**

([https://www.reseaprojournals.com/imb/editorial\\_board](https://www.reseaprojournals.com/imb/editorial_board))

Reviewer, Environmental Science and Pollution Research, Springer, Impact factor 5.0

Advances in Food Production, Processing, and Nutrition (

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## **LANGUAGE SKILLS**

**Bengali:** Native level competency

**English:** Excellent - all skills (Listening, speaking, reading, and writing)

**Chinese:** Beginner's level proficiency including conversational skills

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## PROFESSIONAL MEMBERSHIP

- Member, Iranian Biotechnology Society
  - (<http://www.biotechsociety.ir/>)
  - Philippine Society of Biochemistry and Molecular Biology
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## AREAS OF ACADEMIC EXPERTISE AND RESEARCH INTERESTS

Amino acid and sugar engineering in food crops

Genetic Engineering and Biotechnology

Molecular Biology and Biochemistry of proteins and carbohydrates

## SELECTED PUBLICATIONS (as **Hasan Md. Mahmudul**)

1. **Hasan Md. Mahmudul** (2023) Molecular mechanism to develop high lysine maize following synthetic genetic circuits enabled reprogramming (under preparation)
2. **Hasan Md. Mahmudul\***, Rima R (2021) Genetic engineering to improve essential and conditionally essential amino acids in maize: transporter engineering as a reference. **Transgenic Research**. 30:207–220. **Impact factor 3.145**. (\*Corresponding author).
3. **Hasan Md. Mahmudul**, Hasan MM, Teixeira da Silva JA, Li X (2016) Regulation of phosphorus uptake and utilization: transitioning from current knowledge to practical strategies. **Cellular and Molecular Biology Letters**. 21:7 9. (**Impact factor 8.7**).
4. Pan X #, **Hasan Md. Mahmudul**#, Li Y#, Liao C, Liu R, Li X (2015) Asymmetric transcriptomic signatures between the cob and florets in the maize ear at the silking stage and functional characterization of two amino acid transporters. **Journal of Experimental Botany**, 66(20): 6149–6166. (**#Equal contribution, Impact factor 7.298**).
5. Islam M A, Suzauddoula M, Rabby G, Bonny M, Biswas M, **Hasan Md. Mahmudul\*** (2022). Phylogenetic analysis and protein characterization of arsenic (As) transforming bacterial marker genes following isolation of As tolerant indigenous bacteria. **Archives of Microbiology**, 204:660. Impact factor **2.8** (\*Corresponding author).
6. Islam N, Rabby G, Hossen MM, Kamal MM, Zahid MA, Syduzzaman M, **Hasan Md. Mahmudul\*** (2022) *In silico* functional and pathway analysis of risk gene and SNPs for type 2 diabetes in Asian population. **PLoS ONE** 17(8): e0268826. **Impact factor 3.73**. (\*Corresponding author)
7. Islam N, Rabby G, Hossen MM, Bonny M, **Hasan Md. Mahmudul\*** (2023) Genome-wide identification, functional analysis of amino acid permease and cationic amino acid transporter gene families in maize and their role in drought stress. **South**

- African Journal of Botany** (Under Review). Impact factor **3.2**. (\*corresponding author).
8. Rabby G, Rahman MH, Islam N, Hossen MM, Bonny M, **Hasan Md. Mahmudul\*** (2023) *In silico* identification and functional prediction of differentially expressed genes associated with type 2 diabetes in south Asian populations. **PLoS ONE**. (Minor Revision submitted). Impact factor **3.73**. (\*Corresponding author).
  9. Kamal MM, Islam N, Rabby G, **Hasan Md. Mahmudul\*** (2023) *In silico* screening of deleterious effects of non-synonymous single nucleotide polymorphisms and molecular dynamics simulation of human paired box gene 4. **Submitted**, *Biochemical Genetics*, **Impact factor 2.5** (\*Corresponding author).
  10. **Hasan Md. Mahmudul** (2018) Bioaugmentation approach in rhizospheric microbiome research: a lesson from arsenic remediation. **Malaysian Journal of Halal Research**. 1(1): 15-16 (**Editorial**).
  11. Suzauddula M., Hossain M B, Farzana T, Orchy T N, **Hasan Md. Mahmudul\*** (2021). Incorporation of oats flour into wheat flour noodles and evaluation of its physical, chemical, and sensory attributes. **Brazilian Journal of Food Technology**. 24, e2020252. **Scopus Indexed**. (\*Corresponding author)
  12. Asaduzzaman M, Robbani M, Ali M, **Hasan Md. Mahmudul\***, Begum M, Hasan MM, Silva JAT, Uddin MJ (2015) Mother bulb weight and plant density influence on seed yield and yield attributes of onion. **International Journal of Vegetable Science**, **Cite Score: 2.8, Taylor and Francis**, 21:98–108. (\*Corresponding author).
  13. Haque MR, Robbani M, **Hasan Md. Mahmudul\***, Asaduzzaman M, Hasan MM, Silva JAT (2014) Zinc and boron affect yield and quality of onion (*Allium cepa* L.) seed. **International Journal of Vegetable Science**. **Cite Score: 2.8, Taylor and Francis** 20:131–140. (\*Corresponding author).
  14. Haq MZ, Robbani M, Ali M, Hasan MM, **Hasan Md. Mahmudul\***, Uddin MJ, Begum, M, Silva JAT, Pan XY, Karim MR (2012) Damage and management of Cyclone *Sidr*-affected homestead tree plantations: a case study from Patuakhali, Bangladesh. **Natural Hazards**. 64:1305–1322. SpringerLink. (\*Corresponding author, **Impact factor 3.7**).

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### Research Grant History

Sl. No.	Title of the Projects	Position	Source of Fund	Years	Grant Amount
1	Crispr Cas9 mediated genome editing in soybean	Borlaug Fellowship	USDA	2020	50,000 USD
2	Bioinformatic based prediction and molecular confirmation of SNPs responsible for heritable type 2 diabetics	Principal Investigator	Ministry of Information and Communication Technology, Bangladesh	July 2020- June 21	18,000 USD

3	Development of Jam from under processed fruits of Bangladesh	Principal Investigator	Jashroe University of Science and Technology	July 2018- June 2019	2,000 USD
4	Characterization of rhizospheric bacterial diversity and development novel multi heavy metal-transforming bacteria arising from arsenic, lead, nickel and chromium polluted soils of Bangladesh	Principal Investigator	Ministry of Education, Bangladesh	July 2018- June 2021	23,000 USD
5	Emplacement of an ICT lab for producing ICT skilled Nutrition and Food Technology Graduates	Principal Investigator	Ministry of Information and Communication Technology, Bangladesh	July 2018- June 19	24,000 USD

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**REFEREES** (Please feel free to contact with my referees)

1. Professor Dr. Md. Mainul Hasan (My M.Sc. supervisor)  
Department of Agricultural Botany  
Patuakhali Science and Technology University  
Dumki, Patuakhali, Bangladesh  
Telephone: +88 (0) 1710369940  
E-mail: mainulmh@gmail.com
2. Professor Dr. Md. Abdul Kayum (My M.Sc. supervisor)  
Department of Agricultural Botany  
Patuakhali Science and Technology University  
Dumki, Patuakhali, Bangladesh  
Telephone: +88 (0) 1718360002  
E-mail: kayumagb@gmail.com
3. Professor Dr. Xuexian Li (My PhD Supervisor)  
Department of Plant Nutrition  
China Agricultural University, Beijing 100193, P. R. China.  
Telephone: 0086-10-62732499, Fax: 0086-10-62731016  
E-mail: steve@cau.edu.cn
4. Professor Dr. Fu-Suo Zhang (My PhD supervisor)  
Department of Plant Nutrition  
China Agricultural University, Beijing 100193, P. R. China.  
Telephone: 0086-10-62732499, Fax: 0086-10-62731016  
E-mail: zhangfs@cau.edu.cn or fszhang@mx.cei.gov.cn

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**CERTIFICATION** “I solemnly affirm that all the information stated in this resume is true and complete to the best of my knowledge and belief.”

Signature



Date:

March 14, 2023

**(Md. Mahmudul Hasan, PhD**

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