Dr. Tabassum Hussain

Research Officer/Assistant Professor
Dr. M. Ajmal Khan Institute of Sustainable Halophyte Utilization
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Career Objective

Higher education at its best provides possibilities to combine research with teaching, theory with practice, and thinking with creativity. I see that in teaching and learning it is highly important to intertwine knowledge and skill, which is not well supported by the traditional separation of lectures and exercises in our education system. In addition, good academic education should furnish students with possibilities to develop their critical thinking.

Education

2008-2015	**PhD (Botany/Plant Ecophysiology).** The effect of salinity on morphological, physiological and biochemical responses of *Panicum turgidum* Forssk. Advisor: Prof. Dr. M. Ajmal Khan S.I.
2006	**M.Sc (Ecology-Botany)**, University of Karachi, Karachi, Pakistan.
2003-2005	**B.Sc (Hons)** Botany with Chemistry and Biochemistry University of Karachi, Karachi, Pakistan.

Professional experience

2013- To date:	**Research Officer/Asst. Prof.** Dr. M. Ajmal Khan Institute of Sustainable Halophyte Utilization, University of Karachi
2022- To date:	**Visiting Asst. Professor.** Shaheed Zulfiqar Ali Bhutto Institute of Science and Technology, Karachi.
2017-2019:	**Postdoctoral Fellowship:** The Chinese Academy of Sciences, Fellowship for the young international scientist

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2011-2013: **Lecturer in Botany (BPS-17).** Appointed Lecture through Sind Public Service Commission (SPSC) in Govt. Degree College Malir Cantt. Karachi.

2007 (8 months): **Research Associate.** Project title **Salt induce oxidative stress consequence and possible management**. Funded by: Pakistan Science Foundation (PSF) with Prof. Dr. M. Ajmal Khan. Department of Botany, University of Karachi, Pakistan.

Courses Taught

(ISHU-771)	Plant responses to abiotic stresses
(ISHU-702)	Research Methodology
(ISHU-772)	Ecology of saline habitats
(ISHU-775)	Physiological ecology of halophytes
(Bot-508)	Plant Ecology
(Bot-412)	Fundamentals of Plant Physiology
(Bot-411)	Genetics and Biotechnology;
(Bot-422)	Fundamentals of Plant Ecology

Honors and Awards

2022 **HEC Funded Project under NRPU (Rs 4,261,400).** "Impact of Combined Stress: A Critical Approach for Enhancing Multiple Stress Tolerance in Halophyte Cash Crop Plants"

2022 **Dean Science Funded Project (Rs 150,000).** "Strategic Anatomical Adaptations of Halophytes to Survive Saline and Water Deficit Soils"

2017 **Postdoctoral Fellowship.** The Chinese Academy of Sciences, Fellowship for the young international scientist (Two years)

2016 **First Prize in Poster Competition.** The 14th National Meeting of Plant Scientists and 5th International Conference of Botany (15-18 January, 2016) on the theme "Climate Change and Phyto-diversity: Challenges and Opportunities" Title of Poster, "Proteomics Revealing Importance of Energy Production in Salt Tolerance Mechanisms of a Halophytic Grass"

2009 **Received a scholarship for Germany (split-Ph.D.)** from HEC through "International linkage between University of Karachi and Justus-Liebig-University Giessen, Germany.

2007 **Received a scholarship (Indigenous Fellowship for Ph.D.)** from Higher Education Commission, Islamabad, Pakistan.

2001 **Won 3rd Prize in the Quiz Competition** held in D.J Sindh Government Science Collage Karachi

Publications

2024: Anosha Siddiqui , Anum Gul , Hanzala Khan , Fatima Anjum , **Tabassum Hussain**. Bio-inspired synthesis of silver nanoparticles using *Salsola imbricata* and its application as antibacterial additive in glass ionomer cement. Nanotechnology. 2024 Jun 17;35(35). doi: 10.1088/1361-6528/ad50e4

2024: L Jing, Li: Yujie, Wu: Xiaohui, Feng: **Tabassum, Hussain**: Kai, Guo: Xiaojing, Nonuniform salinity regulate leaf characteristics and improve photosynthesis of cherry tomatoes under high salinity. Environmental and Experimental Botany 217, 105565

2024: B Gul, A Hameed, MZ Ahmed, **Tabassum, Hussain**, SG Rasool, BL Nielsen Thriving under Salinity: Growth, Ecophysiology and Proteomic Insights into the Tolerance Mechanisms of Obligate Halophyte *Suaeda fruticosa* Plants 13 (11), 1529

2023: **Tabassum Hussain**, Hina Asra, Wensheng Zhang, Xiaojing Liu, The combination of salt and drought plays positively in influencing ionbenefits selective ion absorption and nutrient use efficiency of halophyte *Panicum antidotale*. Frontiers in Plant Science 14:1091292

2022: Li J, C Yang **Tabassum Hussain**, X Feng, X Liu, K Guo Long-Term Effect of Tamarisk Plantation on Soil Physical Properties and Soil Salt Distribution in Coastal Saline Land, Agronomy 12 (8), 1947

2022: **Tabassum Hussain**, Hina Asra, Jingsong Li, Xiaohui Feng, Bilquees Gul, Xiaojing Liu, The presence of salts in the leaf exudate improves the photosynthetic performance of a recreto-halophyte, *Tamarix chinensis* Environmental and Experimental Botany, 199: 104896

2022: Robina Sultana, Xiukang Wang, Muhammad Azeem, **Tabassum Hussain**, Athar Mahmood, Sajid Fiaz and Muhammad Qasim Coumarin-Mediated Growth Regulations, Antioxidant Enzyme Activities, and Photosynthetic Efficiency of *Sorghum bicolor* Under Saline Conditions. Frontiers in Plant Science 13:799404

2021: **Tabassum Hussain**, Hina Asrar, Wensheng Zhang, Bilquees Gul, and Xiaojing Liu. Combined transcriptome and proteome to reinforce salt tolerance strategies of Halophyte*: Panicum antidotale* Retz. Frontiers in Plant Science. 12:760589. doi: 10.3389/fpls.2021.760589

2021: **Tabassum Hussain**, Li Jing Song, Feng Xiao-Hui, Hina Asrar, Bilquees Gul, and Xiaojing Liu. Salinity induced alterations in photosynthetic and oxidative regulation are ameliorated as a function of salt secretion.

Journal of Plant Research 134, 779–796 https://doi.org/10.1007/s10265-021-01285-5

2021: **Tabassum Hussain**, Muhammad Yousuf Adnan, Muhammad Zaheer Ahmed, Bilquees Gul, M. Ajmal Khan, and Brent L. Nielsen. Growth regulation of *Desmostachya bipinnata* by a coordinated organ-specific biomass, water relations, and ions allocation responses to improve salt resistance. Acta Physiologiae Plantarum DOI 10.1007/s11738-021-03211-7

2021: Feng Xiaohui, **Tabassum Hussain**, Gua Kai, Ping An. and Xiaojing Liu. Physiological, morphological and anatomical responses of *Hibiscus moscheutos* to non-uniform salinity stress. Environmental and Experimental Botany 182:104301

2021: Muhammad Zaheer Ahmed, **Tabassum Hussain**, Salman Gulzar, Muhammad Yousuf Adnan, Muhammad Ajmal Khan. Calcium improves the leaf physiology of salt treated *Limonium stocksii*: A floriculture crop. Scientia Horticulturae 285 (2021) 110190

2020: **Tabassum Hussain**, Xiaoguang Li, Xiaohui Feng, Jinsong Li, Kai Guo, Bilquees Gul, and Xiaojing Liu. Soil respiration and photosynthetic carbon gain on an abundant coastal land after plantation of *Tamarix chinensis*. Handbook of Halophytes, https://doi.org/10.1007/978-3-030-17854-3_47-1

2020: Abraham Mulu Oljira, **Tabassum Hussain**, Tatoba R. Waghmode Huicheng Zhao, Hongyong Sun, Xiaojing Liu, Xinzhen Wang and Binbin Liu. Trichoderma enhances net photosynthesis, water use efficiency, and growth of wheat (*Triticum aestivum* L.) under salt stress. Microorganisms 2020, 8, 1565

2020: **Tabassum Hussain**, Hans-Werner Koyro, Wensheng Zhang, Xiaotong Liu, Bilquees Gul and Xiaojing Liu1. Low salinity improves photosynthetic performance in *Panicum antidotale* under drought stress. Frontiers in Plant Science. 11:481

2020: **Tabassum Hussain**, Asrar H, Qasim M, Nielsen BL, Gul B, Khan MA. Salt induced modulations in antioxidative defense system of *Desmostachya bipinnata*. Plant Physiology and Biochemistry. 147; 113-124.

2019: Jingsong Lia, **Tabassum Hussain**, Xiaohui Feng, Kai Guoa, Huanyu Chena, Ce Yanga, Xiaojing Liu. Comparative study on the resistance of *Suaeda glauca* and *Suaeda salsa* to drought, salt, and alkali stresses. Ecological Engineering 140 ;105593

2019: **Tabassum Hussain**, Hans-Werner Koyro, Bernhard Huchzermeyer and M. Ajmal Khan. Linkage between leaf development and photosynthetic response at hyperosmotic salinity in the C-4 grass *Panicum antidotale*. Flora: Flora 256, 52–60.

2019: Muhammad Umair, **Tabassum Hussain**, Hanbing Jiang, Ayesha Ahmad, Jiawei Yao, Yongqing Qi, Yucui Zhang, Leilei Min and Yanjun Shen. Water-saving potential of subsurface drip irrigation for winter wheat. Sustainability, 11, 2978; doi:10.3390/su11102978

2018: Zainul Abideen, Muhammad Qasim, **Tabassum Hussain**, Aysha Rasheed, Bilquees Gul, Hans-Werner Koyro, Raziuddin Ansari, and M. Ajmal Khan. Salinity improves growth, photosynthesis and bioenergy characteristics of *Phragmites karka*. Crop and Pasture Science 69, 944–953

2018: Asrar Hina, **Tabassum Hussain**, Gul B, Nielsen BL, Khan MA. Differential protein expression reveals salt tolerance mechanisms of *Desmostachya bipinnata* at moderate and high levels of salinity. Functional Plant Biology 45: 793-812

2017: Asrar Hina, **Tabassum Hussain**, Hadi SMS, Gul B, Nielsen BL, Khan MA. Salinity induced changes in light harvesting and carbon assimilating complexes of *Desmostachya bipinnata* (L.) Staph. Environ Exp Bot 135: 86-95

2016: Adnan MY, **Tabassum Hussain**, Asrar H, Hameed A, Gul B, Nielsen BL, Khan MA. *Desmostachya bipinnata* manages photosynthesis and oxidative stress at moderate salinity. Flora 225: 1-9

2015: **Tabassum Hussain**, Hans-Werner Koyro, Bernhard Huchzermeyer and M. Ajmal Khan. Eco-physiological adaptations of *Panicum antidotale* to hyperosmotic salinity: water and ion relations and anti-oxidant feedback. Flora: 212, 30-37.

2015: Abdul Hameed, Salman Gulzar, Irfan Aziz, **Tabassum Hussain**, Bilquees Gul, M Ajmal Khan Effects of salinity and ascorbic acid on growth, water status and antioxidant system in a perennial halophyte. AoB Plants doi: 10.1093/aobpla/plv004

2014: H. W. Koyro, H. Lieth, B. Gul, R. Ansari, B. Huchzermeyer, Z. Abidin, **Tabassum Hussain**, M. A. Khan Importance of the Diversity in Between Halophytes to Agriculture and Land Management in Arid and Semiarid Countries Sabkha Ecosystems: Volume IV: Cash Crop Halophyte and Biodiversity Conservation, First edited by Khan et al, 02/2014; Springer.

2013: Hans-Werner Koyro, **Tabassum Hussain** , Bernhard Huchzermeyer, M. Ajmal Khan "Photosynthetic and growth responses of a perennial halophytic grass *Panicum turgidum* to increasing NaCl concentrations." Environmental and Experimental Botany 91: 22– 29.

2012: Abdul Hameed, **Tabassum Hussain**, Salman Gulzar, Irfan Aziz, Bilquees Gul and M Ajmal Khan. "Salt tolerance of a cash crop halophyte *Suaeda fruticosa*: biochemical responses to salt and exogenous chemical treatments. Acta Physiol Plant. 34 : 2331–2340.

Editorial Services

I have served member of editorial board

1. Frontiers of Plant Sciences
2. BMC Plant Biology

I have reviewed research articles for:

1. Science of the Total Environment
2. Journal of Experimental Botany
3. Environmental and Experimental Botany
4. Frontiers of Plant Sciences
5. Plant Physiology and Biochemistry
6. Plant Stress
7. Flora
8. Environmental science and pollution research international
9. Industrial crops and products
10. Journal of arid environments
11. Journal of soil science and plant nutrition
12. Plant biosystems
13. Scientia horticulturae
14. South African journal of botany

Seminar and Conferences Attended

2023: Invited lecture on training workshop entitled "Improving Salinity Tolerance of Conventional and Non-conventional Crops under Extreme Environmental Conditions". Organized by Pakistan Science Foundation and Sindh Engro Coal Mining Company on July 12-14, 2023.

2023: Invited lecture on training workshop entitled "Hands on Training: Essential Molecular Techniques". Organized by ORIC, University of Karachi on July 04, 2023.

2023: Invited lecture in an international conference entitled "Sustainable Food Security Solutions". Organized by Faisalabad Agriculture University, University of Karachi and CPEC Consortium of Universities on May 29-31, 2023.

2022: Invited trainer for "Hands on training workshop on SPSS". Organized by ORIC, University of Karachi on September 15.

2019: Participate and Organizer: 2nd International conference on Sustainable Development: Halophyte for Green Revolution, Karachi, Pakistan on January 7-9.

2018: Participate and Organizer: The First International Symposium on Efficient Utilization of Agricultural Resources and Sustainable Development, Shijiazhuang, China on October 25-27.

2018: Poster Presentation; International Symposium on Synthetic Biology in Photosynthesis Research, Shanghai, China, on August 8-10. Title of

Poster "The Photosynthetic Responses of *Panicum antidotale* under Salinity, Drought and Combination of both Stresses"

2017: Participate and Organizer. International Symposium on High Efficient Utilization of Saline Soil, China on September 9-11.

2017: Poster Presentation; The XIX International Botanical Congress (IBC 2017), Shenzhen, China, on July 23-29, 2017. Title of Poster "Calcium Improves the Leaf Physiology of Salt Treated *Limonium stocksii*: A Floriculture Crop"

2016: 14th National and 5th international conference of Botany, Climate change and phytodiversity: Challenges and opportunities. University of Karachi, Karachi, Pakistan. January 15-18, 2016**.**

2016: ICEH 2016- 4th International Conference on Environmental Horizon, Valuing and Conserving Nature, which was held on January 8-10, 2016. University of Karachi.

2014: Participate in Workshop. HEC workshop on Hands-on Training in Ecophysiological Techniques (April 12-14, 2014) held at Institute of Sustainable Halophyte, University of Karachi.

2011: Participate in Workshop, "Hands-on EndNote Referencing" Category 1 Credit Certificate (3 Credit) at Aga Khan University, Karachi

2011: Participate in Hands on Training on "Modern Techniques in Research on Abiotic Stress Tolerance in Plants' held at Nuclear Institute for Agriculture and Biology (NIAB), Fasialabad.

2011: Participate in Workshop, "Advances in Ecophysiology of Salt Tolerance" held at Institute of Sustainable Halophyte, University of Karachi.

2011: Poster Presentation in "2nd International conference of Plant Science" held at department of botany, GC University Lahore.

2010: Attended summer school held in Institute of Botany, Leibniz University Hannover, Hannover Germany.

2009: Workshop on "Biosafety trends in Pakistan" organized by Aga Khan University.

2008: Workshop on Recent Trends in Plant Sciences: Impact on Biodiversity 16-18 April, 2008, organized by Institute of Sustainable Halophyte Utilization, University of Karachi, Karachi.

Supervision of Students

Mphill/PhD Levels

Sahar un Nisa:
The effect of multiple abiotic stresses on eco-physiological responses of Panicum antidotale
Afshan:
Potential Utilization of Microbiota from Extreme Habitats for Enhancing Plant Resilience Against Stress
Zarlish Waqar :
A Comparative Study of Anatomical Adaptations of Halophytes from Coastal Habitat.
Syeda Tuba Batool:
Consequences of single and multi NPs to alleviate salinity in different halophytes

Masters Levels
Hafiza Sadia:
Growth responses of Chenopodium quinoa under salinity stress
Masooma Batool;
The eco-physiological responses of Atriplex griffithii under salinity, high temperature and combination of both stresses
Hiba-Tur-Rehman
Physiological and anatomical responses of the halophyte Salvadora persica the combined effect of salinity + drought and salinity + flood

Scientific Instrument Handled

- Li-Cor 6400XT, Portable Photosynthesis equipment with Fluorescence meter (Li-Cor, USA).
- Pulse Amplitude modulated Chlorophyll Fluorescence meters , M series Imaging PAM, PAM 2500, PAM 210 and Junior PAM. (Walz, Germany)
- RT-PCR and DNA gels
- Western blotting.
- IPG and 2D gel Electrophoresis with Gel Doc system (Bio-RAD, USA)
- Atomic Absorption Spectrophotometer, AAs 700 Perkin Elmer (USA)
- HR-33T, Wescor Dew Point micro-voltmeter (Wagtech Inc., USA).
- Microscopy
- Osmometer, Osmostat 030 (Germany)
- Model 600, Plant Water Status Console (PMS Instruments, USA).

Membership of Scientific Societies

Life Time: Pakistan Botanical Society
Since 2006: Plant stress Group
Since 2006: International Society for Halophyte Utilization

Extra Qualification

2013: Graduate Assessment Test (GAT) Subject (97 percentile)
2007: Graduate Assessment Test (GAT) General (92 percentile)
Microsoft Office,
R software
Sigma plot v12,
SPSS 24,
Delta 2DE, Data manager in 2DE
SmartPLS

Interests and Hobbies

My interests include literature, poetry, human rights, cricket, badminton and Chess

References

Prof. Dr. Hans-Werner Koyro
Institute of Plant Ecology,
Justus-Liebig University Gießen,
D-35392 Gießen, Germa
E-mail: hans-werner.koyro@bot2.bio.uni-giessen.de

Prof. Dr. Xiaojing Liu
The Center for Agricultural Resources Research
Institute of Genetics and Developmental Biology of CAS
Shijiazhuang, 050022, Hebei, China
E-mail: xjliu@sjziam.ac.cn

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