

CURRICULUM VITAE

Prof. Dr. Bilquees Gul

Member of Pakistan Academy of Sciences

Professor, Dr. Muhammad Ajmal Khan Institute of Sustainable Halophyte Utilization
University of Karachi. <http://www.halophyte.org/>

Mailing address

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Major Research Interests

Dr. Gul's research interest deals with the ecological management of inter-tidal, coastal and inland saline ecosystems. Specific research interests include: screening of coastal halophytes (salt tolerant plants) for bio-fuel, bio-diesel, edible oil, medicines and essential oils. Genomics and transcriptomic studies for identification and characterization of salt tolerance genes of halophytes. Comparative or systematic Proteomics of halophytes to distinguish stress protein produced under various level of saline stress.

Education

Ph. D. **Plant Ecophysiology. 1998.** Brigham Young University, Provo, Utah, USA. Dissertation:
Ecophysiology and population biology of the perennial halophytic shrub *Allenrolfea occidentalis* (S. Wats.) Kuntze (Chenopodiaceae) growing in a salt playa near Goshen, Northwestern, Utah, USA.
Advisor: Dr. Darrell J. Weber.

M. Sc. **Botany/Plant Ecology. 1992.** University of Karachi, Karachi-75270, Pakistan. Thesis:
Demography, osmoregulation, germination and seed bank dynamics of *Arthrocnemum indicum*.
Advisor: Dr. M. Ajmal Khan.

Professional Societies

1995- Botanical Society of America (BSA)
1996- Ecological Society of America (ESA)
1997- Plant Population Biologist Group
1998- Pakistan Botanical Society (PBS) Life Member

- 2006- Member, Third World Organization for Women in Science (TWOWS)
 - 2006- Member, Organization for Women in Science for the Developing World (OWSD)
 - 2007- Member Pakistan Academy of Sciences (PAS)
 - 2011- American Society of Plant Biologists (ASPB)
 - 2011- Member, Pakistan Society for Biochemistry and Molecular Biology
 - 2012- American Society for Biochemistry and Molecular Biology (ASBMB)
 - 2012- United Nations Educational, Scientific and Cultural Organization (UNESCO), -Chair-holder
 - 2012- Member Non-European, COST-Action
 - 2012- American Society for Microbiology (ASM)
 - 2015- Member, Quest4Africa
 - 2015- Member ICARDA
 - 2016- Member of the Technical Committee of Pakistan Science Foundation (PSF)
 - 2017- Member, Promoting Science and Technology led Development in Pakistan, The Ministry of Planning, Development & Reform (MoPDR), Pakistan.
 - 2017- Ex-Officio Member of Sindh Sustainable Development Board under section 9(iii) of the Sindh Environmental Protection Act-2014.
 - 2017- Editorial Board of Science Alert Journals.
 - 2019- Editorial board of International Journal of Crop Production in Harsh Environment.
 - 2019- Advisory Board Member of the Journal of Physiological Ecology and Environmental Sciences.
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Professional Experience

- 2012 - 2021 Director, Institute of Sustainable Halophyte Utilization, University of Karachi, Karachi.
- 2011 - todate Professor, Institute of Sustainable Halophyte Utilization, University of Karachi, Karachi.
- 2011- 2012 Visiting faculty in the Department of Microbiology and Molecular Biology, Brigham Young University, Provo, Utah, USA worked with Prof Brent Nielson.
- 2009–2013 Associate Professor, Institute of Sustainable Halophyte Utilization, University of Karachi, Doing research on proteomes and genomes of various group halophytes. Survey of the potential oil bearing seeds from halophytes which may be used as edible oil, biofuel, bio-diesel and essential oils.
- 2007-2009 Associate Professor, Department of Botany, University of Karachi. Teaching ecology, general botany to undergraduates and population biology and physiological ecology to graduate students. Continuing research on the ecophysiology of local halophytic species of Karachi, Pakistan.
- 2007 Postdoctoral fellow in the Department of Microbiology and Molecular Biology, Brigham Young University, Provo, Utah, USA worked with Prof Brent Nielson.
- 2002-2007 Assistant Professor, in the Department of Botany, University of Karachi.
- 2001-2002 Full-time co-operative teacher in the Department of Botany, University of Karachi.
- 1998-2001 Conducting a postdoctoral research in the Halophyte Biology Laboratory, Department of Botany, University of Karachi, on a National Science Foundation, USA research project entitled "Ecophysiological study of coastal halophytes of Pakistan" under the guidance of Dr. M. Ajmal Khan. University Grant Commission has also provided partial support to work on the project.
- 1995-1998 Graduate student in the Department of Botany and Range Science, Brigham Young University, Provo Utah, 84602, USA. Worked on my doctoral dissertation entitled

	<p>"Ecophysiology and population biology of the perennial shrub <i>Allenrolfea occidentalis</i> (Wats.) Kuntze Chenopodiaceae growing in a salt playa near Goshen, North Western Utah".</p> <p>I have taken following courses to fulfill the requirement 1. Developmental plant physiology, 2. Plant molecular biology, 3. Scanning electron optics, 4. Principles and application of instrumentation in the biological sciences I, 5. Principles and application of instrumentation in the biological sciences II, 6. Wildland shrubs, 7. Research orientation, 8. Seed physiology and 7. Computer programming. In addition I have taught plant pathology, plant ecology, plant physiology, scanning electron microscopy, general botany, principles and application of instrumentation in the biological sciences I, and principles & applications of instrumentation in the biological sciences II to undergraduate and graduate students.</p>
1993-1994	Lecturer of Plant Ecology at Jinnah University for Women, Karachi. Pakistan.
1993-1995	Research student in the Department of Botany, University of Karachi, Pakistan worked for the M. Phil. Thesis entitled "Ecophysiology and demography of <i>Arthrocnemum macrostachyum</i> : a coastal halophyte" in the lab of Dr. M. Ajmal Khan.
1991-1993	Graduate student in the Department of Botany, University of Karachi. I have taken following courses: 1. Plant physiology, 2. Plant ecology, 3. Morphology, bryophytes, pteridophytes and gymnosperms, 4. Taxonomy, 5. Phycology, 6. Mycology, 7. Genetics, 8. Cell biology, 9. evolutionary ecology, 10. Population biology, 11. Advanced ecology, 12. Edaphology, 13. Mineral nutrition, 14. Biostatistics and 15. Statistical ecology. I took plant ecology at M. Sc. (final) and submitted a thesis entitled "Demography, ecophysiology and seed bank dynamics of coastal halophyte <i>Arthrocnemum indicum</i> " for the fulfillment of the partial requirement for the M. Sc. degree.
1987-1989	Undergraduate in Botany, Urdu Science College Karachi, Pakistan. I have taken following Courses: Chemistry, Botany and Zoology

Professional Activities

1. Joint Secretary/Pakistan Botanical Society for the years 2003 and 2004.
2. Manuscript reviewer of Pakistan Journal of Botany (2002-present), Annals of Botany, England (2004 - present), Annals of Applied Botany, South Africa (2004 – Present), Egyptian Journal of Science (2002 – present).
3. Project reviewer for South African National Research Foundation (2004– present).
4. Chairperson of a session in High Saline Tolerant Plants International Symposium, May 11-13, 2004. Brigham Young University, Provo, Utah, USA.
5. Chairperson, Eco-physiological section in International Conference of Bio-saline Agriculture and High Salinity Tolerance. January (9-14, Mugla-Turkey). 2005.
6. Chairperson, International conference on Biosaline Agriculture and High Salinity Tolerance, Tunisia, 2006.
7. International Linkage Program of Pakistani Universities with foreign University. RIKEN, Yokohama, Japan, 2007.
8. International Linkage Program of Pakistani Universities with foreign University. University of Tsukuba, Japan, 2008.
9. Chairperson, International symposium on Halophyte Utilization, Nanpi Field Station, Nanpi, China, 2008.
10. Member of the curriculum revision committee, Higher Education Commission of Pakistan. 2008-2010.
11. Ecology Sectional Head, Department of Botany, University of Karachi. 2007-2010.

12. Ex-Officio Member of Sindh Sustainable Development Board under section 9(iii) of the Sindh Environmental Protection Act-2014.
13. Chairperson, Quest 4 Africa meeting, organized by UNESCO, Addis Ababa. 2015.
14. Ph.D. Supervisor External. University of South Africa. 2015.
15. Reviewer of the various international impact journals.
16. Chairperson, 2nd International Conference on "Physiological, Biochemical and Molecular Arguments for salt Tolerance, Qatar University. 2015.
17. TWAS 13th General Conference and 26th General Meeting, Austrian Academy of Sciences (OeAW) Vienna, November 17-22, 2015.
18. Co-Organizer, 4th International Conference of Environmental Horizon, ICEH, 2016.
19. Chairperson, 4th International Conference of Environmental Horizon, ICEH, 2016.
20. Co-Organizer, 14th National and 5th International Conference of Pakistan Botanical Society, "Climate Change and Phytodiversity: Challenges and Opportunities. January, 15-18, 2016.
21. Chairperson, 14th National and 5th International Conference of Pakistan Botanical Society, "Climate Change and Phytodiversity: Challenges and Opportunities. January, 15-18, 2016.
22. Project Evaluation committee member, Pakistan Science Foundation (PSF), Natural Sciences Linkage Program (NSLP) ongoing-projects in Karachi and Tandojam. Meeting at PASTIC Sub Center Karachi, 2016.
23. Invited Speaker at the workshop on "Drylands" presenting "Food Security in drylands", 4th Congress of Biosphere Reserves, 2016.
24. Member of the Technical Committee of Pakistan Science Foundation (PSF)
25. Member, Promoting Science and Technology led Development in Pakistan, The Ministry of Planning, Development & Reform (MoPDR), Pakistan.
26. Founding Members of the Mekong Mangrove Forum. UNESCO Biosphere and partners.
27. Guest editor of a special issue "Recent advances in research on halophytes from fundamental to applied aspects". 2020.
28. Editor in-chief of the Book series "Blue Carbon Ecosystems". Springer
29. Editorial Board of "Journal of Crop Production in Harsh Environments". 2020
30. Editorial Board Member Journal of Crop Production in Harsh Environments" Published by University of Birjand. 2020.
31. Editorial Board Member, Journal of Salinity Management and Research, Education and Extension Organization, Iran. 2020.

Academic awards and honors

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| 2020 | Lingnan Chair Professor at Foshan University, China |
| 2020 | Atraaf-e-Khidmat Award for leading Women of the Country 2020" for the recognition and contribution of her services to the nation. |
| 2020 | Executive Council Member of the Biological Society of Pakistan |
| 2018 | Global Goodwill Ambassador. |
| 2017 | Ex-Officio Member of Sindh Sustainable Development Board under section 9(iii) of the Sindh Environmental Protection Act-2014. |
| 2017 | Focal Person, University of Karachi. Higher Education Commission of Pakistan |
| 2017 | HEIs PQR Focal Person, University of Karachi. Higher Education Commission of Pakistan |
| 2015 | FLORA, Certificate of Outstanding Contribution in Reviewing, in recognition of the contribution made to the quality of the journal. |

2015	Certificate of Appreciation on World Environment Day, UNEP
2015	Climate Change Resilience Committee Head, Quest 4 Africa, Science for Sustainable Human Living, UNESCO, Addis Ababa
2015	Co-director and Technical advisor, of the research project on “Mangroves along the Cameroon’s Coast and Maritime Zone”. African Mangrove Network
2014	FLORA, Certificate of Reviewing, in recognition of the review made for the journal.
2014	Co-Chair meeting with Dr. Gebisa Ejeta, on “Task Force on Grand Challenges”, Organized by International Board, American Society for Microbiology
2013	World Environment Day, Certificate of Appreciation, UNESCO
2012	Member Academic Council, University of Karachi
2012	Member Senate, University of Karachi
2012	UNESCO UNI/TWIN chair holder
2012	Member Food and Agriculture COST-Action, International Partner Countries
2011	Cash Award of Research productivity allowance (Rs. 60,000).
2011	Molecular Biology of halophytes, Postdoctoral fellowship at Brigham Young University, USA.
2007	Genomics of salt tolerant plants, Postdoctoral fellowship at Brigham Young University, USA.
2006	Member, Pakistan Academy of Sciences.
2005	Pakistan Academy of Sciences Gold medal of Botany
2004	Cash Award of Research productivity allowance (Rs. 60,000).
2004	Ranked 30 th among biologist by Pakistan Council of Science and Technology, Islamabad in a publication entitled “Productive Scientists of Pakistan”
2003	Shakoori gold medal for best young plant biologist awarded by Pakistan Zoological Society.
2003	Approved Ph. D. supervisor under the Scholarship Programs of the Ministry of Science and Technology.
2003	Cash Award of Research productivity allowance (Rs. 120,000).
2000	Cash Award of Research productivity allowance (Rs. 60,000).
1999	University Grants Commission, Pakistan award of “Support to Scientific Talent” Scholarship.
1998	Winter semester tuition award, Brigham Young University, Utah, USA.
1998	Botanical Science scholarship, Brigham Young University, Utah, USA.
1997	Fall tuition award, Brigham Young University, Utah, USA.
1997	University honor scholarship, Brigham Young University, Utah, USA.
1996	Tuition award from Brigham Young University, Utah, USA.
1995-1998	Teaching and research assistantship, Department of Botany and Range Science, Brigham Young University, Provo Utah, USA.
1995	Botany Scholarship from Botany and Range Science Department, Brigham Young University.
1994	Chiniote Biraderey Scholarship
1993	Infraq Foundation Scholarship

Committee Services

2015	Member ICARDA
2015	Member Quest 4 Africa, Ethiopia
2014	Member of Academic council, University of Karachi
2014	SIUT volunteering activities
2013	Reviewer, HEC Outstanding Research Awards
2013	Shaukat Khanam Cancer Hospital, volunteering activities

- 2013 Program Director, Free research internship for O and A level students
2012 Member Senate, University of Karachi
2012 Head, Departmental Research Committee (DRC)
2012 Member Faculty of Science, University of Karachi
2012 UNESCO environmental protection volunteering activities
2010 Member of the board of Science Faculty, University of Karachi
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Research Awards / Research Grant

- 2002 Effect of different salts on the germination of *Suaeda fruticosa*. Faculty of Science. University of Karachi. (Rs. 0.1 Millions).
2003 Seawater tolerance of *Halosarchia indica* from Gadani Coast. Pakistan Science Foundation. (Rs. 0.24 Millions).
2004 Influence of calcium on seed germination of *Arthrocnemum macrostachyum* under saline conditions. Faculty of Science. University of Karachi. (Rs. 0.1 Millions).
2005 Effects of potassium, magnesium and calcium of *Arthrocnemum macrostachyum*. Faculty of Science. University of Karachi. (Rs. 0.1 Millions).
2006 Exploiting the potential of halophytes as source of edible oil. Higher Education Commission. (Rs. 3.3 Millions).
2008 Proteomic studies in Mangrove under salinity stress. Higher Education Commission of Pakistan. (Rs. 3.05 Millions).
2011 Building Capabilities for the Molecular and Biochemical Characterization of Photosynthesis and Oxidative stress Gene Expression in Halophytes with Potential Use as Non-Conventional Crops. Pak-Us Joint Academic & Research Program, Higher Education Commission (Rs. 14.132 Millions).
2012 Effect of humic acid on seed germination and seedling growth of halophytes. Faculty of Science, University of Karachi. (Rs. 0.1 Millions).
2015 Assessing and improving bioethanol production potential of selected halophytes, Higher Education Commission of Pakistan, (Rs. 2.38 Millions)
2016 ROS mediated signaling ion flux: halophytes versus crop plants. Higher Education Commission of Pakistan, (Rs. 8.9 Millions).
2019 Revealing Mechanistic Basic of Salt secretion in halophytic grasses to improve salinity stress tolerance in cereal crops. Project under PSF-National Science Foundation, China 3rd call. (Rs. 14.97 Million).
2021 Research and demonstration on saline water plantation and utilization in Thar-Desert of Pakistan. PSF/CRP/18th Protocol (06)
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Collaborative research projects

- 1- Study of selection of microbiome by salt accumulator and salt excluder halophyte. Department of Microbiology, University of Karachi. 2017.
- 2- Exploring potential of halophytic mass for the production of cellulose, xylanase and compost. Department of Microbiology, University of Karachi. 2017.
- 3- Production of xylanase from halophytic biomass. Department of Microbiology, University of Karachi. 2015.
- 4- Biofuel production from non-conventional crops. Department of Microbiology, University of Karachi. 2015.

- 5- Plant cell wall degrading enzymes from locally isolated fungi grown on natural substrate. Department of Microbiology, University of Karachi. 2015.
- 6- Restore saline soils using microorganisms. Qatar University. 2014.
- 7- Building Capabilities for the Molecular and Biochemical Characterization of Photosynthesis and Oxidative stress Gene Expression in Halophytes with Potential Use as Non-Conventional Crops. Pak-US Joint Academic & Research Program, Higher Education Commission. 2011.

Industry Linkages/Memorandum of Understandings

1. **Agri-Kraft: 2015** - MOU between Agri-Kraft Farm (AKF) and Institute of Sustainable Halophyte Utilization (ISHU): "To grow nutritious fodder crop in mass scale under saline conditions in AFK farm near Lahore and develop appropriate feed for livestock in this area".
2. **Sindh Engro Coal Mining Company: 2016** - MOU between Sindh Engro Coal Mining Company (SECMC) and Institute of Sustainable Halophyte Utilization (ISHU), University of Karachi, Karachi, Pakistan: "Biosaline fodder plantation project at Thar Coal Mining Area, Block II".
3. **Iqra University, Pakistan: 2017** - MOU between Iqra University Karachi and Institute of Sustainable Halophyte Utilization (ISHU), University of Karachi: "Domesticating various halophyte to serve as a source of fodder, forage, biofuel, oilseeds, and medicinal plants".

PATENTS /GENE BANK SUBMISSIONS

1. Patent No. 141125: M. A new cropping system for fodder production by using saline resources. Ajmal Khan, Haibat Ali, Bilquees Gul and Raziuddin Ansari
2. NCBI: *Aeluropus lagopoides* Plasma memberane Na⁺/H⁺ antiporter (SOS1), mRNA sequence (ISHU-Ala-4; GenBank: GW796824.1 GI: 293626647)
Ahmed, M.Z., Shimazaki, T., Gulzar, S., Kikuchi, A., Gul, B., Watanabe, K.N., Khan, M.A.
<http://www.ncbi.nlm.nih.gov/nucest/GW796824.1>
3. NCBI: *Aeluropus lagopoides* H⁺-ATPase, mRNA sequence (ISHU-Ala-3; GenBank: GW796823.1 GI: 293626646)
Ahmed, M.Z., Shimazaki, T., Gulzar, S., Kikuchi, A., Gul, B., Watanabe, K.N., Khan, M.A.
<http://www.ncbi.nlm.nih.gov/nucest/GW796823.1>
4. NCBI: *Aeluropus lagopoides* beta actin like, mRNA sequence (ISHU-Ala-2; GenBank: GW796822.1 GI: 293626645)
Ahmed, M.Z., Shimazaki, T., Gulzar, S., Kikuchi, A., Gul, B., Watanabe, K.N., Khan, M.A.
<http://www.ncbi.nlm.nih.gov/nucest/GW796822.1>
5. NCBI: *Aeluropus lagopoides* H⁺PPase (Soluble Inorganic Pyrophosphatase/ pyrophosphate Phospho-hydrolase), mRNA sequence (ISHU-Ala-1; GW796821.1 GI: 293626644)
Ahmed, M.Z., Shimazaki, T., Gulzar, S., Kikuchi, A., Gul, B., Watanabe, K.N., Khan, M.A.
<http://www.ncbi.nlm.nih.gov/nucest/GW796821.1>

cDNA libraries:

- 1- A cDNA library of *Suaeda fruticosa* a highly salt tolerant plant were made for identifying and isolating salt tolerant genes.
 - 2- cDNA libraries of *Panicum turgidum* and *Salvadora persica* are under construction.
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Manuscript Reviewer

Annals of Botany
Environmental and Experimental Botany
Acta Physiologia Plantarum
Land Degradation and Development
Journal of Arid Environment
BMC Plant Biology
Biologia Plantarum
Scientia Horticulturae
Environmental Science and Pollution Research
Estuarine coastal and shelf science
Ecolind
Pakistan Journal of Botany
African Journal of Biotechnology
International Journal of Plant Sciences
Ecologia
Elsevier Editorial System (EES)
Biofuels

Seminar, Summer School, or Conference

- 1994 Variation in productivity as affected by monsoon rains and periodic differential inundation in coastal salt marsh community. International Symposium on High Salinity Tolerant plants, Karachi, Pakistan, December 12-16 with Dr. M. A. Khan.
- 1996 Productivity of a coastal salt marsh dominated by *Arthrocnemum indicum*. Fourth Symposium on Biogeochemistry of Wetlands, New Orleans, LA, USA, March 4-6 with Dr. M. A. Khan.
- 1996 Seed dimorphism in *Arthrocnemum indicum* from Karachi, Pakistan. Botanical Society of America annual meeting at Seattle, Washington, USA, August 6-10 with Dr. M. A. Khan.
- 1997 Population ecology of sub-tropical coastal halophytes *Arthrocnemum indicum*. International conference on the Biology of coastal Environments. Bahrain 6-9 April with Dr. M. A. Khan.
- 1997 Effect of salinity and thermoperiod on the seed germination of *Allenrolfea occidentalis* (S. Wats.) Chenopodiaceae. Botanical Society of America annual meeting at Montreal, Quebec, Canada, August 3-9 with Dr. D. J. Weber.
- 1997 Chemical components in the South African lichen, *Pseudocyphellaria aurata*. Botanical Society of America annual meeting at Montreal, Quebec, Canada, August 3-9 with Dr. D. J. Weber.
- 1998 Action of osmotica, growth regulators and nitrogenous compounds in alleviating the effect of salinity on the germination of *Allenrolfea occidentalis* seeds. 1998, student research poster presentation at College of Biology and Agriculture, Brigham Young University, Provo, USA. March 9-13 with Dr. D.

- J. Weber.
- 1998 Seed bank dynamics in a Great Basin salt playa. 1st annual intermountain paper and poster symposium, Logan, Utah. April 1-3 with Dr. D. J. Weber.
 - 1998 Effect of intra-specific competition and inundation regime on the growth of *Arthrocnemum indicum* population. 1st annual intermountain paper and poster symposium, Logan, Utah. April 1-3 with Dr. M. A. Khan.
 - 1998 Alleviation of seed dormancy in *Allenrolfea occidentalis*. Botanical Society of America annual meeting at Baltimore, Maryland, August 2-6 with Dr. D. J. Weber.
 - 1998 Effect of salinity and temperature on the germination of dimorphic seeds of *Suaeda torreyana*. Botanical Society of America annual meeting at Baltimore, Maryland, August 2-6 with Dr. M. A. Khan.
 - 1998 Population dynamics of a perennial halophyte *Allenrolfea occidentalis*. The Tenth Wildland Shrub Symposium: Shrubland Ecotones, Ephraim, Utah. August 12-14 with Dr. D.J. Weber and Dr. M. A. Khan.
 - 1998 Seed bank strategies of coastal populations at Arabian Sea coast. Tenth Wildland Shrub Symposium: Shrubland Ecotones. Ephraim, Utah, USA. Aug. 9 – 13, with Dr. M. A. Khan.
 - 1998 Halophytic fungi from inland salt playa. 6th International mycological conference, 23-28 August, Jerusalem, Israel, with Dr. D.J. Weber.
 - 1998 Comparison of chemical composition of *Pseudocyphellaria aurata* from South Africa and Argentina. 4th African Mycological congress, RMC4 (Regional mycological congress), August, 16-19, Nairobi, Kenya with Dr. D.J. Weber.
 - 1998 Fatty acid composition of seeds of halophytes. International Botanical Congress, St. Louis, USA, with Dr. D.J. Weber and Dr. M. A. Khan.
 - 2000 *Arthrocnemum macrostachyum*: a potential case for agriculture using above seawater salinity. International Seminar on Prospects of Saline Agriculture" Islamabad, Pakistan
 - 2000 Potential uses of *Allenrolfea occidentalis*. International Seminar on Prospects of Saline Agriculture" Islamabad.
 - 2000 Salt tolerance of *Salicornia rubra* from salt playa of Great Basin desert. International Seminar on Prospects of Saline Agriculture" Islamabad, Pakistan.
 - 2000 Saline Agriculture: promises and prospects for future agriculture in degraded saline lands. Technology and Development in New Millennium. Karachi, Pakistan.
 - 2000 Salt tolerance of *Sarcobatus vermiculatus*. Pakistan Botanical Society, Lahore, Pakistan.
 - 2001 Some ecophysiological aspects of seed germination in halophytes. International Symposium of the Halophyte Utilization and Regional Sustainable Development of Agriculture, Huanghua, China.
 - 2001 Role of temperature in affecting the salt tolerance of the halophyte seeds. International Symposium of the Halophyte Utilization and Regional Sustainable Development of Agriculture, Huanghua, China.
 - 2003 Recovery of seed germination of halophytes from high salinity and temperature stress. 8th. National Meeting of Plant Scientists, Karachi, Pakistan.
 - 2004 Recovery responses of halophytic seeds. US-Pakistan joint workshop on the Biology of Halophytes, Provo, Utah, USA. May 2004.
 - 2004 Capacity building workshop. Annual APN IGM/SPG meeting. April, 12-14, 2004.
 - 2004 Sustainable halophyte utilization. Pak-China technical collaboration visit to China. June-2004.
 - 2004 Sustainable halophyte utilization. Pak-China collaborative visit to China, 15-31 December, 2004.
 - 2005 Calcium induced reversal of salinity effects on seed germination of *Urochondra setulosa*. International Conference of Biosaline Agriculture and High Salinity Tolerance, January 9-14, 2005 (Mugla-Turkey).

- 2005 Calcium induced reversal of salinity effects on seed germination of *Urochondra setulosa*. International Conference on Biotechnology for Salinity and Drought Tolerance in Plants. 28-31 March, 2005, Islamabad.
- 2006 International conference on Biosaline Agriculture and High Salinity Tolerance, Tunisia, 2006.
- 2006 Seed bank dynamics. International conference on Biosaline Agriculture and High Salinity Tolerance, Tunisia, 2006.
- 2006 Workshop in teaching of modern concepts in Plant sciences. Kohat University of Science and technology, June 10-14, 2006.
- 2006 International Symposium at the Department of Botany, University of Agriculture, Faisalabad, 2006.
- 2007 Seed germination and recovery patterns of Halophytes. Brigham Young University, Provo, Utah, USA, 2007.
- 2007 International Linkage Program of Pakistani Universities with foreign University. RIKEN, Yokohama, Japan.
- 2007 International Linkage Program of Pakistani Universities with foreign University. University of Tsukuba, Japan.
- 2007 International symposium on Halophyte Utilization, Nanpi Field Station, Nanpi, China.
- 2008 International Conference of Bio-Asia: the Global Bio-Business Forum, Hyderabad, India, 2008.
- 2008 Workshop on Recent trends in Plant Sciences: Impact on biodiversity. April 16-18, ISHU.
- 2008 National Curriculum Revision Committee meeting in Botany at Higher Education Commission of Pakistan, regional center May 6-7, Lahore.
- 2009 Proteomics in health and Disease. Higher Education Commission of Pakistan-COMSTECH, Thematic workshop in Frontier Technologies. August 17-20. COMSTECH Islamabad.
- 2009 Launching of ISAAA Brief: 39 Press Conference and Scientific Communication Workshop on implementation of the strategy for development of Biotechnology in Pakistan. Pakistan Biotechnology Information Center (PABIC).
- 2010 National Curriculum Revision Committee meeting in Botany at Higher Education Commission of Pakistan, regional center Karachi. March 1-3.
- 2011 Workshop on Proteomics, Washington, USA.
- 2012 Bioinformatics software training workshop, USA.
- 2012 Utah Plant Genetics Conference. Aspen Grove Utah.
- 2013 International Workshop on Mechanism of Plant Stress Tolerance and Sustainable Use of Saline Resources, at Agriculture Resource Research Center of Institute of Genetics and Development, Chinese Academy of Sciences. China. October 13-20, 2013.
- 2013 Halophytes: a source for natural antioxidants. 14th Asian symposium on medicinal plants, spices and other natural products (ASOMPS-XIV).
- 2013 14th Asian symposium on medicinal plants, spices and other natural products (ASOMPS-XIV).
- 2014 IB Task Force Grant Challenges meeting. Washington DC.
- 2014 COST FA 0901- Putting halophytes to work from genes to ecosystems brought together. April 9-10, Coimbra Portugal.
- 2014 American Society for Microbiology Annual Meeting. Boston, USA.
- 2014 International Conference on creating food self-sufficiency in Thar utilizing indigenous groundwater resources" September 13-14, 2014. Organized by: Dawood University of Engineering and Technology, Center for innovation, Research, Creativity, Learning and Entrepreneurship (CIRCLE), Institute of Sustainable Halophyte Utilization.
- 2015 Halophyte development in view of limited freshwater availability and ISHU. Practical guide: Science and Technology Innovation in support of the United Nations 2015, Sustainable development goals on biodiversity, climate change and water. Quest 4 Africa. May 28-29, UNESCO Liaison office Addis

- Ababa, Ethiopia.
- 2015 Horizon 2020: Building a science bridge between the Europe and Pakistan. August, 19. Organized jointly by: The European Union Delegation to Pakistan, Pakistan Science Foundation and University of Karachi.
 - 2015 TWAS 13th General Conference and 26th General Meeting, Austrian Academy of Sciences (OeAW) Vienna, November 17-22, 2015.
 - 2015 2nd International Conference on “Physiological, Biochemical and Molecular Arguments for Salt Tolerance”; October 12-14, 2015; Qatar University, Doha, Qatar.
 - 2016 Co-Organizer, 4th International Conference of Environmental Horizon, ICEH, January 2016.
 - 2016 14th National and 5th International Conference of Botany – Climate Change and phytodiversity: Challenges and Opportunities. January 15-18 2016, University of Karachi, Karachi, Pakistan.
 - 2016 Invited Speaker at the International Conference on “Major Environmental Constraints to Plants: Assessment and Reclamations”. March 28-30, Government College University, Faisalabad.
 - 2016 Invited Speaker at the workshop on “Drylands” presenting “Food Security in Drylands”, 4th Congress of Biosphere Reserves, 2016.
 - 2016 Organized the “International Workshop on Sustainable Development and Environment Protection”, December 3-4, 2016. Institute of Sustainable Halophyte Utilization, University of Karachi, Karachi, Pakistan.
 - 2016 Organized the “International Synergy Meeting on the Sustainable Utilization of Saline Resources In Support of United Nations Sustainable Development Goals with Special Emphasis on Renewable Energy based on Biofuels”, 5-7 December, 2016.
 - 2017 Round Table Conference on “Promoting Science & Technology led Development in Pakistan” at the Ministry of Planning, Development & Reform, Islamabad.
 - 2017 Invited Speaker at the “International Symposium on High-efficient Utilization of Saline Resources” at Center for Agricultural Resources Research, Institute of Genetics and Developmental Biology, Chinese Academy of Sciences. September 21-24, 2017 Shijiazhuang, Hebei, China.
 - 2017 Strategic Management Workshop for HODs of Public Sector HEIs of Pakistan under Modern University Governance Program from November 20-21, 2017 at HEC Regional Center Karachi.
 - 2018 Validation meeting on Sindh drought management and mitigation policy. A Collaboration of Department of P&D, Sindh Government and Food & Agriculture Organization (FAO) U. N. March, 06th, 2018 at Movenpick Hotel Karachi.
 - 2018 “Integration of Sustainable Development Goals (SDGs) into Agriculture and Natural Resources Management (ANR) for Provincial Planning”. Two-Days Multi Stakeholder SDG Landing Workshop, A Collaboration of Department of P&D, Sindh Government and Food & Agriculture Organization (FAO) U. N. March 20th-21st, 2018 at Movenpick Hotel Karachi.
 - 2018 Organized the “1st International Conference on the Sustainable Development: Halophytes for the Green Revolution”, 16-19th, April 2018. at Institute of Sustainable Halophyte Utilization, University of Karachi.
 - 2018 Organized the “World Mangrove day” in collaboration with UNESCO. 26th July, 2018.
 - 2018 Pakistan – US Science and Technology Start-up and Ideation training program. August 28-31, 2018. Dubai, UAE.
 - 2018 Provincial Validation workshop on GCF project “Transforming the Indus Basin with climate resilient agriculture and climate smart water management. April 17, 2018 at Marriot Hotel Karachi.
 - 2018 FAO and other relevant stakeholders to improve early warning information and set up a Early Warning Action (EWEA) system in Tharparker region. December 17th, 2018 at Movenpick Hotel Karachi.
 - 2019 Organized the “2nd International Conference on the Sustainable Development: Halophytes for the

- Green Revolution”, 07-09 January, 2019.
- 2019 Mekong Mangrove Network Meeting in Hanoi, Cat Ba, Vietnam, 17-21 March 2019.
- 2019 The Belt and Road (B&R) forum 1st of Plant Membrane Biology. April 8-10, 2019. Foshan, Guangdong, China.
- 2020 Implications of Salicornia and Halophytes in Global Sustainability. Arizona State University Tempe Campus. March 5-7, 2020.
- 2020 Saline Agriculture Scaling up opportunities and challenges. Webinar organized by FAO and WASAG. May 26, 2020
- 2020 Water and Soil Management in Salt Affected Areas. Webinar organized by Food and Agriculture Organization of the United Nations and WASAG. June 02, 2020.
- 2020 Program: WASAG Webinar Series No 5: Collaboration on Promoting Quinoa (Part 1). June 15, 2020.
- 2020 Water and Nutrition: From Research to Action. Webinar organized by FAO. June 22, 2020
- 2020 Pandemic/Epidemic Drought & Agriculture: Building Back Better. July 10, 2020.
- 2020 Webinar on Covid-19 and its relationship with nature-Build Back Better. Organized by WWF Pakistan and UNESCO.
- 2020 An Innovative Perspective on Food Security: Halophyte Crops for the Future. Botany 2020, Virtual Botany Conference. July 27-31
- 2020 “3rd Mekong Mangrove Forum – Blue carbon ecosystem conservation, restoration and sustainable utilization in the Greater Mekong Sub-region and beyond” October 1st, 2020. Organized by UNESCO and Partners. (Online at Zoom).
- 2020 “Prof. Dr. M. Ajmal Khan Memorial International Virtual Symposium: Halophytes for Science and Society”. UNESCO World Science Day for Peace and Development. November 10th, 2020. Organized by Dr. Muhammad Ajmal Khan Institute of Sustainable Halophyte Utilization (MAK-ISHU), University of Karachi.
- 2021 Prof. Dr. Muhammad Ajmal Khan Memorial Virtual Lecture Series- “eHALOPH, a database of salt-tolerant plants” by *Prof. Dr. Tim Flowers*. January 12th, 2021. Organized by Dr. Muhammad Ajmal Khan Institute of Sustainable Halophyte Utilization (MAK-ISHU), University of Karachi.
- 2021 Prof. Dr. Muhammad Ajmal Khan Memorial Virtual Lecture Series- “Effects of chemical pollutants on marine life” by Dr. Munawwer Rasheed. On the occasion of World wetland day. February 02nd, 2021. Organized by Dr. Muhammad Ajmal Khan Institute of Sustainable Halophyte Utilization (MAK-ISHU), University of Karachi.
- 2021 “International Virtual Conference on Ecophysiology and sustainable use of cash crop halophytes- a tribute to Dr. Muhammad Ajmal Khan” April 06-08th, 2021. Organized by Dr. Muhammad Ajmal Khan Institute of Sustainable Halophyte Utilization (MAK-ISHU), University of Karachi.

Collaborators (last 48 months)

1. Dr. Benno Boer (UNESCO- Thailand)
2. Prof. Miguel Clustner (UNESCO- France)
3. Prof. Hans-Werner Koyro (Germany)
4. Prof. Dr. Sergey Shabala (Australia/China)
5. Prof. Dr. Brent L. Nielsen (USA)
6. Prof. Dr. D. J. Weber (USA)

7. Prof. John Prince (USA)
 8. Prof. Dr. Xiaojing Liu (China)
 9. Prof. Dr. Yoshiharu Fujii (Japan)
 10. Prof. Dr. Munir Ozturk (Turkey)
 11. Prof. Tim Flowers
 12. UNESCO (MAB)
 13. Chinese Academy of Sciences
 14. ICARDA
 15. FAO
 16. Environmental Protection Agency EPA
-

List of PhDs/Graduates produced

Research supervised (Ph.D.)

S.No.	Name	Year	Topic	Level
01	Ms. Aysha Rasheed	2015	Demography and seasonal ecophysiology of a leaf succulent halophyte <i>Salsola drummondii</i>	Ph.D. completed
02	Ms. Sarwat Ghulam Rasool	2016	Salt Resistance of <i>Halopeplis perfoliata</i> : a coastal salt marsh stem succulent halophyte.	Ph.D. completed
03	Ms. Hina Asrar	2017	Proteomics for investigating salinity stress related proteins in <i>Desmostachya bipinnata</i> .	Ph.D. completed
04	Ms. Sumaira Manzoor	2017	Seeds germination responses of <i>Zygophyllum propinquum</i> to different ionic, osmotic and chemical treatments	Ph.D. completed
05	Ms. Sonia Bano	2017	The effects of humic acid on seed germination and seedling growth of sub-tropical halophytes	Ph.D. completed
06	Ms. S. Midhat Sabahat	2017	Salt tolerance in <i>Salvadora persica</i>	Ph.D. completed
07	Ms. Sadaf Tauqeer	2019	Chemical screening of commercially important compounds from seeds of halophytes.	Ph.D. completed
08	Ms. Saba Nazir	2019	Effect of salinity on phenolic composition and antioxidant activity of halophytes	Ph.D. completed
09	Ms. Shahjehan Jilani	2019	Photoblastic responses of halophyte seeds during germination	Ph.D.

				completed
10	Ms. Noor Fatima	2020	Optimization of biomass production under stress conditions of <i>Phragmites karka</i> , a species important to bioenergy crop development.	Ph.D. completed
11	Ms. Shazia Anjum Qadri	2020	Phenol profiling of heteromorphic seeds of <i>Halopyrum mucronatum</i> .	Ph.D. completed

Research Supervision (ongoing)

S.No.	Name	Year	Topic	Level
01	Ms. Rabab Fatima Rizvi	2013	Ecophysiological studies of <i>Typha domingensis</i> , a potential bioenergy plant under different stress conditions.	Ph.D. (ongoing)
02	Ms. Afshan Ahsen	2017	ROS mediated signaling in ion flux: halophytes versus crop plants	MS (ongoing)
03	Ms. Shahla Rafique	2018	Comparative study on ROS signaling in <i>Arthrocnemum macrostachyum</i> and <i>Spinacia oleracea</i>	MS (ongoing)

Research supervised (M.Sc. Thesis)

S.No.	Name	Year	Topic	Level
01	Ms. Hina Asrar	2008	Alleviation of salinity induced germination inhibition of succulent halophytes by using various gibberellins under light and dark conditions	M.Sc. Thesis completed
02	Ms. S. Midhat Sabahat Hadi	2008	Effect of exogenous application of gibberellins on the seed germination of halophytic grasses under salinity stress	M.Sc. Thesis completed
03	Ms. Faiza Khan	2006	Effect of different salt and temperature with and without calcium on the germination of <i>Aerva</i> .	M.Sc. Thesis completed
04	Ms. Sumaira Suleman	2006	Effect of different salt and temperature on the germination of <i>Zygophyllum simplex</i>	M.Sc. Thesis completed
05	Ms. Fazila Yousuf	2006	Role of secondary metabolites to salt stress in coastal and inland halophytes	M.Sc. Thesis completed
06	Mr. S Zulfiqar Mehdi	2006	Screening of different halophyte seeds for the potential source of edible oil	M.Sc. Thesis completed

07	Ms. Saba Nazir	2005	Demography and seed bank analysis of halophytes <i>Atriplex stocksii</i> , <i>Cressa cretica</i> and <i>Suaeda fruticosa</i> from inland and coastal populations	M.Sc. Thesis completed
08	Ms. Faiza Sheikh	2003	Effect of sodium, magnesium and potassium with and without calcium in light and dark on seed germination of <i>Urochondra setulosa</i>	M.Sc. Thesis completed

LIST OF PUBLICATIONS (May, 2021)

Total Impact Factor: 153.944; Total Citations: 4769

H-index: 38, i10-index 98, RG factor 36.56

<https://scholar.google.com.pk/citations?user=6KAeb0sAAAAJ&hl=en>

https://www.researchgate.net/profile/Bilquees_Gul

http://www.halophyte.org/htmls/dr_gul.htm

Book Edited

1. Handbook of Halophytes. From Molecules to Ecosystems towards Biosaline Agriculture. Gul, B (Co-Editor). Springer (In Preparation).
2. **Gul, B.** B. Boer, M. A. Khan, M. -C. Godt, and A. Hameed (Editors), 2019. Sabkha Ecosystems: Volume VI: The Asia and Pacific, Tasks for Vegetation Science 49, Tasks for Vegetation Science 48, DOI 10.1007/978-3-319-27093-7, © Springer Science+Business Media Dordrecht 2019.
3. Khan, M. A., B. Boer, M. -C. Godt, S. Breckle, **B. Gul**, and M. Ozturk (Editors), 2016. Sabkha Ecosystems: Volume V: The Americas, Tasks for Vegetation Science 48, Tasks for Vegetation Science 48, DOI 10.1007/978-3-319-27093-7, © Springer Science+Business Media Dordrecht 2016.
4. Khan, M. A., M. Ozturk, **B. Gul**, and M.Z. Ahmed (Editors). 2015. Halophytes for Food Security in Dry Lands. Academic Press.
5. Khan, M. A., B. Boer, T. Abdelsalaam, M. -C. Godt, **B. Gul**, and M. Ozturk (Editors), 2014. Sabkha Ecosystems: Volume IV: Cash Crop Halophyte and Biodiversity Conservation, Tasks for Vegetation Science 47, DOI 10.1007/978-94-007-7411-7_26, © Springer Science+Business Media Dordrecht 2014.

Published peer reviewed articles (in impact factor journals)

		Impact Factor
1	Adnan, M.Y., Hussain, T., Ahmed, M.Z., Gul, B. , Khan, M.A. and Nielsen, B.L., 2021. Growth regulation of <i>Desmostachya bipinnata</i> by organ-specific biomass, water relations, and ion allocation responses to improve salt resistance. <i>Acta Physiologiae Plantarum</i> , 43(2), pp.1-12.	1.760
2	Hussain, T., Koyro, H.W., Zhang, W., Liu, X., Gul, B. and Liu, X., 2020. Low Salinity Improves Photosynthetic Performance in <i>Panicum antidotale</i> under Drought stress. <i>Frontiers in Plant Science</i> , 11, p.481.	4.407
3	Muhammad, H., Qasim, M., Ikram, A., Versiani, M.A., Tahiri, I.A., Yasmeen, K., Abbasi, M.W., Azeem, M., Ali, S.T. and Gul, B. 2020. Antioxidant and antimicrobial activities of <i>Ixora coccinea</i> root and quantification of phenolic compounds using HPLC. <i>South African Journal of Botany</i> , 135, pp.71-79.	1.792
4	Syed Zaheer Shah, Aysha Rasheed, Bilquees Gul , M. Ajmal Khan and Hameed, A. 2020. Maternal salinity improved vigor and stress tolerance of the seeds of euhalophyte <i>Suaeda fruticosa</i> . <i>Journal of Arid Land</i> , https://doi.org/10.1007/s4033-020-0054-1 .	1.899
5	Ahmed, M.Z., Parveen, F., Gulzar, S., Gul, B. and Khan, M.A., 2020. Effects of chloride and sulfate salts on seed germination of halophytes from dry alpine climate. <i>Journal of Plant Nutrition</i> , pp.1-12.	1.132
6	Shoukat, E., Ahmed, M.Z., Abideen, Z., Azeem, M., Ibrahim, M., Gul, B. and Khan, M.A., 2020. Short and long term salinity induced differences in growth and tissue specific ion regulation of	1.591

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- 12 Diray-Arce, J., Knowles, A., Suvorov, A., O'Brien, J., Hansen, C., Bybee, S.M., **Gul, B.**, Khan, M.A. and Nielsen, B.L., 2019. Identification and evolutionary characterization of salt-responsive transcription factors in the succulent halophyte *Suaeda fruticosa*. PloS one, 14(9), p.e0222940. 2.740
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Ecophysiological adaptations and anti-nutritive status of sustainable cattle feed *Haloxylon stocksii* under saline conditions. Flora, p.151425.
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- 18 Tqeer, S., Qasim, M., Abideen, Z., **Gul, B.**, Rasheed, M., & Khan, M. A. 2018. Chemical Composition and Antioxidant Activity of Seeds of Various Halophytic Grasses. Journal of the American Oil Chemists' Society. 1.601
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- 21 Hadi, S. M. S., Ahmed, M. Z., Hameed, A., Khan, M. A., & **Gul, B.** 2018. Seed germination and seedling growth responses of toothbrush tree (*Salvadora persica* Linn.) to different interacting abiotic stresses. *Flora*, 243, 45-52. 1.591
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- 23 SG Rasool, A Hameed, MA Khan, **B Gul**. 2017. Seeds of *Halopeplis perfoliata* display plastic responses to various abiotic factors during germination. *Flora*, 236, 76-83 1.591
- 24 Bano, S; Ahmed, MZ.; Gulzar, S.; **Gul, B.** 2017. Effect of humic acid on seed germination of sub-tropical halophytes under salt stress. *Pakistan Journal of Botany*, 49 (6). 0.800
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- 27 Syeda Saniya Zahra, Madiha Ahmed, Muhammad Qasim, **Bilquees Gul**, Muhammad Zia, Bushra Mirza and Ihsan-ul Haq. 2017. Polarity based characterization of biologically active extracts of *Ajuga bracteosa* Wall. ex Benth. and RP-HPLC analysis. *BMC Complementary and Alternative Medicine*. 17:443 DOI 10.1186/s12906-017-1951-5 2.833
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- 29 Kumari, D., Z. Abideen, M. Sohail, S. Jahangeer, **B. Gul**, M.A. Khan, S.A. Khan. 2017. Plant cell-wall hydrolyzing enzymes from indigenously isolated fungi grown on conventional and novel natural substrates. *Pakistan Journal of Botany*, 49, 745-750. 0.800
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- 54 Hameed, A., M.Z. Ahmed, S. Gulzar, **B. Gul**, J. Alam, A.K. Hegazy, A.R.A. Alatar and M.A. Khan. 2013. Seed germination and recovery responses of *Suaeda heterophylla* to abiotic stresses. *Pakistan Journal of Botany*, 45: 1649-1656 0.800
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